The Chemical Age

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Notes and Comments

The Dyestuffs Act

TWELVE members of the Dyestuffs Industry Development Committee have signed a report recommending the continuance of the Dyestuffs (Imports Regulation) Act for three years. Two members—the representatives of the colour-users—recommend that the Act should be allowed to lapse. Elsewhere in this issue of THE CHEMICAL AGE the progress of the dyestuffs manufacturing industry during 1932 is surveyed in detail, giving the conclusions upon which the recommendation for the continuance of the Act is based. Those signing this report in the majority declare that British makers are fulfilling their undertaking to "supply at world prices," but they admit the recent "appreciable" increase in the price of dyestuffs (a matter of 22½ per cent. on the average), and produce no evidence that a similar movement in prices has taken place in other countries. The colour-users, in the minority, maintain that since the formation of the international cartel the freedom to obtain foreign quotations—except for new colours—has been seriously limited. The majority acknowledges and accepts this condition of affairs, and by inference approves a monopolistic division of the world market which tends to destroy the foundation on which the whole case for the special treatment of the dyestuffs industry rests.

The British Association of Chemists

THE British Association of Chemists has, for fifteen years, been engaged in the advancement of the interests of chemistry as an essential element in the national life, the encouragement of scientific education and research, the raising of the economic and professional status of all qualified chemists and the protection and promotion of the economic welfare of its members, and to-day it has reached a membership of 1,517, a net increase of 99 over the total recorded twelve months ago. Few other chemical organisations in this country have been able to record anything approaching this rate of progress during a time of unprecedented depression. Most of the purely scientific bodies have been confronted with reduced membership, and have been compelled to consider the possibilities of unification from the economic standpoint. The British Association of Chemists, on the other hand, is an ardent supporter of unification, not so much from the point of view of the corporate body as from the standpoint of the individual. Professor Baly, its new president, stated at the annual dinner at Birmingham on Saturday that he had good reason for believing that the time was not far distant when an amalgamation scheme would mature, but Professor Morgan said the unification negotiations were delicate at the present stage.

Whatever may be the ultimate constitution of the unified chemical organisations, the British Association of chemists must be in it. Its record of service in protecting the economic and professional status of chemists is one that must be recognised in any movement towards a reduction in the number of societies. While the Association has not encroached widely upon the province of the more scientific bodies it has striven consistently to maintain the welfare of its members and its legal aid department has done much to impress upon industry the responsible part which the chemist plays in modern commercial life. Its fifteenth annual meeting and dinner at Birmingham on Saturday was one of the most widely representative gatherings in its history, and not the least important feature of the proceedings was the tribute paid to Mr. Woodley and his staff for the manner in which they have served the Association.

Beet Sugar Factory Effluents

NOW that the beet sugar factories are again in operation the question of the effective disposal of effluents might be profitably revived by the chemical engineer. When the Water Pollution Research Board began its activities this industry had only recently developed on an extensive scale, but as serious cases of river pollution were notified preliminary work carried out by the Board indicated that it might be advisable to suggest modifications in the factory processes with the object of reducing the quantity or of altering the composition of the effluent as opposed to the introduction of new methods for purification of the effluent. According to a review upon this subject which appears in "Nature" for November 19, a factory of average size deals with 1,000 to 1,500 tons of beet per day, and the total quantity of fluming and washing water varies from 2½ to 3½ million gallons. Added to this there is process water, removed from the spent cossettes, and washings from the diffusers, which may total 300,000 to 500,000 gallons per day. Water from the condensers which comprises cooling water and condensate obtained in the removal of 75 to 80 per cent. of the water present in the beet juice, is of the order of 3 million gallons per 1,000 tons of beet treated, but this water is often used again in the flumes for the purpose of conveying the beets to the washers. The fluming and washing water which is definitely polluting in character, but though larger in quantity it is not so objectionable as process water. The latter contains from 0.2 to 0.4 per cent. of sugar and ferments rapidly on storage, whilst it also takes up large quantities of oxygen from any

river into which it may be discharged. As a result of the investigation during 1927-30, the Water Pollution Research Board definitely concluded that by suitable modifications in the factory processes, the major quantities of the fluming and washing water and of the process water could be re-used, leaving little or no effluent for disposal. Certain factories have for several seasons re-used the fluming and washing water after simple treatment by screening and sedimentation to remove solid matter, and the re-use of this water has proved to be entirely satisfactory. At some factories, moreover, the cossettes are extracted by a continuous process of diffusion in which the water removed from the spent cossettes is returned to the diffuser, and in this process there is very little waste water for disposal. Even with the intermittent process in a battery of diffusers, large scale trials in the factory have shown that after preliminary treatment with lime or by other simple methods, the process water can in large measure be re-used in place of fresh water. The effluent from the condensers is not very polluting in character, but it is advisable that it be cooled before discharge to a river, or it may be cooled and re-used.

The Burden of Local Rates

WHEN the National Government came into power last year and made a large cut in public expenditure in order to balance the Budget, we warmly welcomed this first proof of its courage and statesmanship. Still, we thought it right to issue a warning that it was only a first instalment of a policy which, if it was to succeed in restoring the commercial prosperity of the nation, would have to be prosecuted for a term of years with a resolution not usually associated with political leaders. The Government is entitled to the thanks of the trading community for having squared the national accounts and thereby laid the foundations for the most honest Budget which any Chancellor of the Exchequer had introduced for years. Another Budget looms ahead, and the decisions to be taken by the Government before it is introduced next spring will be of the first importance, inasmuch as it is dealing now not with a sudden emergency, but with a permanent problem demanding a long-range solution.

The position, as everybody engaged in the business of buying and selling sees it, is that the burdens of rating and taxation are intolerably high, and that there can be no lifting of the depression until they are substantially reduced. The limited class on which these burdens have fallen in overwhelming measure has responded to the demands of national and local authorities with a wholeheartedness which could not be reproduced in any other country in the world. It quite clearly cannot yield the same figures next year as this, with the long continued story of lower profits, diminishing dividends, and cuts in private incomes. Accordingly the only hope, first of a balanced Budget next April and then of reduced taxation, lies in a far lower level of public expenditure than the present scale.

Drastic Cuts Necessary

THE Government has made a notable contribution to this end with its huge conversion operations. The saving made directly by the Treasury is in the right direction, but it is not nearly enough. The next step is wholesale retrenchment in every branch of the public service, both national and local. The taking of this formidable step has at last been made possible by the publication of two reports, within a week of one another, showing in detail how and where economies can be secured. These reports were made quite independently by an unofficial committee of Members of Parliament, and by a committee set up by the Government itself to explore the whole field of local expenditure. The two Committees are in agreement in estimating the savings which could be made in expenditure from rates and taxes at a gross figure of round about £40,000,000. They cover much the same ground. But while the report of the Ray Committee appointed by the Government is the more authoritative, that by the House of Commons back benchers is of almost equal importance in assuring ministers of a great body of support in any attempt to carry out even the most drastic recommendations. There is no need to make a detailed survey of the suggested savings; the reports are readily available and will repay the closest study by every business man. It is enough to say that both committees agree in recommending a drastic financial overhaul of local expenditure on education, housing, roads and health services.

It is difficult to see how the Government can resist the force of some of the general principles enunciated by the Ray Committee. One of its strongest points is that a halt should be called to legislation involving local authorities in fresh expenditure, seeing that these authorities have already more than enough to do in perfecting their organisation to carry out the many new duties assigned to them in recent years. Again, it states that the encouragement of increased local expenditure has been most marked in services aided by percentage grants and recommends that the principle of equitable block grants should be extended to as many as possible of those services. A majority of the members of this committee have come to the conclusion that the total salaries and wages bill of local authorities, excluding teachers and police, can be reduced by no less than £5,000,000 a year.

Fruitful Retrenchment

THE mere recital of a few of the Committee's basic ideas shows the vast field which is open to the Government for what may fairly be called fruitful retrenchment. There is no getting away from the fact that Government Departments and local authorities alike have been given so much money to spend since the war that they have got into the habit of thinking that spending and efficiency are synonymous terms. Until this fatal habit is eradicated there can be no hope of a revival of prosperity. The only way out of the present difficulties, as we began to advise our readers when the doctrine was extremely unpopular, is by a complete change of heart. A permanent Under-Secretary of a Government Department or a town clerk of a municipal authority has only to apply to the head of a competitive business to get the sound answer to his argument about the relation between expenditure and efficiency. All business men have been forced by the cost of public finance in the last eighteen months to review every branch of their expenditure. Most of them have discovered, often to their surprise, wasteful or extravagant items, which had been overlooked in times of prosperity. These have now been cut out, and there has been in addition a tightening up in every department to secure more economical working.

The Case Against Standardisation of Chemical Analysis

By P. F. THOMPSON

The author of this article is Acting Professor of Metallurgy at the University of Melbourne. These extracts are taken from a paper which he read before the Analytical Group of the Victoria Branch, Australian Chemical Institute.

If the origin of standardisation of analytical methods be traced, it will be found that it grew mostly out of a quaint conceit of the analyst in stating his results in terms which conveyed an impression of superlative accuracy. The doctor is said to bury his mistakes; the lawyer gets his fees win or lose; the engineer covers his errors with an ample "factor of safety"; but the unsophisticated chemist lays bare his limitations when he reports analyses with too many decimals of a per cent. He allows no margin whatever for slight adventitious errors of manipulation, calculation or sampling. And he gives himself no latitude for those inevitable disagreements with his fellows arising from the personal equation. It it had been the custom to suppress all doubtful figures in an analysis the public would have been none the wiser and none the worse off.

A Lack of Common Sense

In the eyes of the law a contract to supply or deliver certain materials fulfilling some expressed requirements as to composition must be honoured to the full, or the contract is void. The analysts in whose hands lies the work of assessing the composition of commodities for buyer and for seller tend to become partisans and consciously or unconsciously weight the scales on their own side. A method of analysis, incapable of giving values closer than, say, plus or minus 1 per cent. of the truth, in the hands of biased analysts provides a nice bone for legal contention. The judicial mind, not concerned with the absolute truth but merely seeking agreement with arbitrary conditions in a contract, makes a strong case out of variations which to the technical man are of minor importance. Again, the engineer, used to expressing his measurements on a scale which does not exceed the delicacy of his measuring appliances, becomes exasperated at the apparent stupidity of the chemists in their inability to agree.

The chemist, naturally of a retiring nature, blames his "methods" and not his own lack of common sense; so on his "methods" fall the heavy hand of the law. Official or standard methods of analysis are drawn up, and the chemist meekly submits, as does no member of any other learned profession, to the dictation of an external authority; and often enough, like a puny fellow in the hands of a policeman, has a certain feeling of comfort in the protection so afforded.

It seems to me that those who advocate the introduction of standard methods of analysis are endeavouring to shirk the duty of making themselves masters of their work, and are allowing themselves to become mere slaves of the written word. They are throwing the responsibility of making decisions, which they themselves should be able to make, on some convenient authority. If they cannot sit in judgment on their analytical methods, let them no longer call themselves chemists, but let them join the ranks of those who will shortly be displaced by mechanical devices constructed by men who use the grey matter with which they have been endowed.

Mechanical Analysers

The advent of mechanical analysers marked a new era in the scientific control of industry. Beginning with the simple determination of carbon dioxide, there are now instruments, mostly of an electrical nature, recording diligently and accurately, day and night, composition, or properties depending on composition, which previously were performed by the laborious efforts of works chemists. Further, these robots not only measure but control an operation more reliably than many a workman. As time goes on such appliances will be made of greater amplitude and power; lacking but the one human attribute of thought, they will carry out analyses which may be regarded as the very perfection of standard methods, for they may easily be adjusted with a mechanical accuracy of a thousandth of an inch to do work with a reliability corresponding. Such a machine will satisfy all the criteria demanded of a standard analytical method. It will be perfectly consistent with itself. It will give perfectly concordant results with all other robots of the same pattern, and, in short, having no morals whatsoever, it may be made to give any result plus or minus of the truth by the mere adjustment of a screw. It will require very little imagination to see that standardisation must be accompanied by mechanisation, and in a completely standardised world chemical analysis as we know it will have vanished.

If it is the fate of chemistry to be little more than the drudge of trade, then are we not hastening its enslavement by submitting to directions having their origin more in authority than in science. Let those few in whose hands the compiling of such standard methods as we have at present, enlighten us as to the manner in which these superior methods of manipulation came into being. I am afraid it would be a sorry tale. Just imagine Hidebound Tradition, Archaic Authority, Hearsay Evidence and Individual Idiosyncrasy hand in hand dancing around the cauldron each contributing its quota to the mess of trouble for chemists unborn, while Science, repelled by the din, stands by with a grim smile. This might be too lurid a picture, but are we to have committees of analytical authorities to prescribe for us with aldermanic pomposity? Would conclaves of works chemists be sufficiently versed in chemical criticism or have the time to do the work? Are academic chemists always seized with the necessity for rapid methods and prompt results? Will buyers and sellers care a rap for chemical niceties? Yet all these will want representation on the authorising committee. In the absence of scientific data, methods would be tried out, and goodness knows when they would be found satisfactory! The job would become so big that only a government department could carry the load, and we all know at what a state of bureaucratic tyranny the whole thing would arrive when politicians began to pull the strings. All initiative would be frowned upon, the love of investigation killed in its infancy and Imagination, that bright pioneer of Science and Art, driven from our schools.

Petty Directions

But it would not go as far as that, you say. If standardisation is of any value it must not be half-hearted. There is nothing gained by allowing a considerable portion to remain still susceptible to human frailty and ignorance. No! Train your man properly! Once an intelligent dog has learnt the art of driving sheep, a whistle is sufficient direction thereafter. What properly trained chemist could submit to such petty directions as "wash the precipitate three times," or "use a 250-ml. beaker 15 cm. high," and so forth. Let us have better and still better methods of analysis but, above all, let us understand fully the chemistry of these. The vague terms expressing concentrations, solubilities, stabilities and the like of most of our aptly called "cookery book methods" have been tolerated too long, and this complacency shows that the analyst if not the chemist has had little concern for anything but "results." Results that are judged to be true on the approximation of duplicates, and often enough without even that imperfect check.

Of late years I have been in a position to hear expressions of dissatisfaction with the work of analysts and chemists. These not only hinted at incompetence, but at a lack of probity as well. I cannot think for a moment that the accusations of duplicity can carry any weight. I am sure that our profession has as few black sheep as any other. A disgruntled client perhaps who has been told an unsavoury truth for a good fee may thus vent his spleen. Nevertheless, one cannot help feeling that there is an undercurrent lowering our status in the eyes of the other professions. The imposition of standard methods indicates a loss of that independence of thought and action which should be the most sacred possession of a professional man. Let that young chemist who would live by the practice of analysis be fully equipped with chemical understanding and common sense. Not only in the schools and colleges, but in the technical laboratories, take care that the younger men do not drift into the ranks of the mere testers each with a standard method in one hand and a beaker in the other.

Laboratory Machinery for Crushing and Grinding

Combining Efficiency with Accessibility

This article is based on information supplied by the Sturtevant Engineering Co., Ltd., who have been makers of crushing, grinding and screening machinery for many years and have also devoted their attention to the design of small units to meet the requirements of sampling and small-scale manufacturing laboratories.

THE importance of providing efficient and adequate machinery for crushing and grinding operations in modern laboratories cannot be over-estimated. Success in the bulk primary reduction of any materials lies chiefly in the selection of a unit of the correct capacity.. Added to this there is the necessity for the interior of the machine to be easily accessible for inspection, cleaning, or attention that might be required from time to time, and means should be provided for avoiding damage due to foreign material gaining access to the machine. For secondary reduction the crushing roll is probably the most popular machine, and when operated at full load it will give results which are difficult to surpass by any other type of machine in the same field.

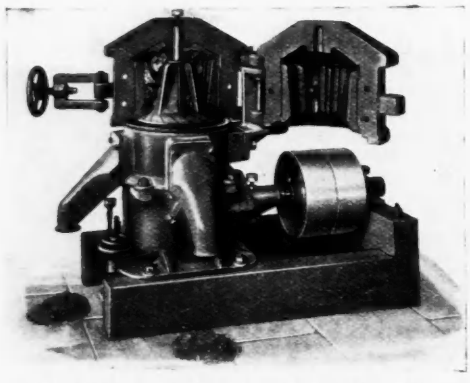

Fig. 1.—Sturtevant Rotary Fine Crusher (No. 00) for sampling coal, showing access to interior.

Fig. 2.—Sturtevant Rotary Fine Crusher (No. 000) operated by hand power.

Fig. 3.—Sturtevant Roll Jaw Crusher, showing hand-wheel for regulating degree of fineness.

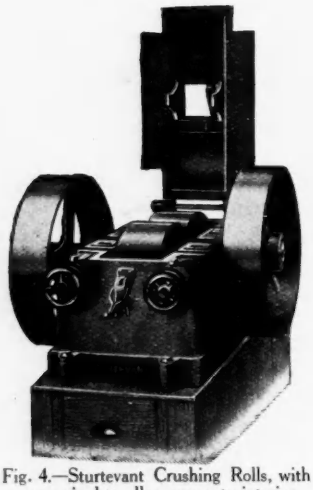

Fig. 4.—Sturtevant Crushing Rolls, with cover raised to allow access to interior.

The Sturtevant fine crusher shown in Fig. 1 is made for the preliminary crushing of soft and moderately hard materials such as barytes, bauxite, chemicals, coal, coke, colours and gypsum. The material in being reduced is subjected to two distinct crushing processes. First a nipping action, and then a grinding or shredding action. For obtaining samples for testing purposes from a quantity of material this rotary crusher is ideal. As the material is reduced the sample is automatically extracted and discharged through a separate spout. This sample may be as small as 5 per cent. or as much as 15 per cent. of the bulk, and when a very small sample is required the material delivered through the sampling spout may be put through the machine a second time. The final sample so obtained, although very small, will then accurately represent the whole of the material passed through the crusher.

To purchasers of coal, the rotary crusher has proved invaluable, for as buying coal is buying heat, it is most important that only the coal which shows the best ratio between calorific value and cost should be bought. The majority of big consumers check the quality of the coal delivered by testing samples in a calorimeter, which often results in big savings, but, the samples must truly represent the bulk, or the result will be inaccurate and misleading. Samples taken haphazard cannot be relied upon, and this is where the machine proves its value as a combined crusher and sampler. It automaticaliy extracts a truly representative sample containing the correct proportion of good, medium and bad coal, together with slate and other waste matter.

The machine is made in two sizes, capacities being one to two cwt. per hour and ten to twenty cwt. per hour respectively. The smaller unit (Fig. 2) is normally supplied for hand power, but can be arranged directly-coupled to an electric motor where it is to be regularly in use for coal or other sampling purposes.

To reduce very hard materials a crusher must be well and strongly built. Such a machine is the Sturtevant laboratory roll jaw crusher (Fig. 3), which will reduce the hardest of materials to a fineness varying from relatively coarse size

to ¼ in. The setting of the jaws to give a required fineness is readily done by a hand-wheel behind the stationary jaw, and the whole of the product must be crushed to the set size before it can pass out of the machine. The front of the machine opens out like a pair of doors, so that the interior

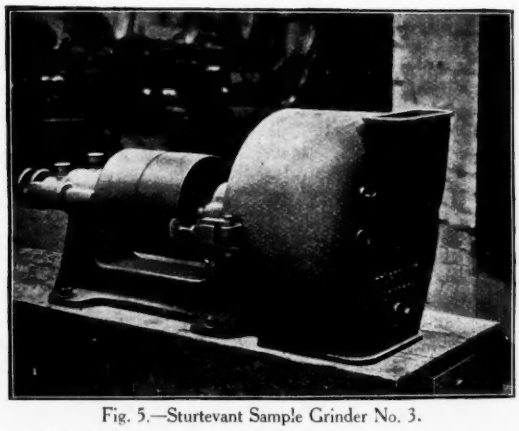

Fig. 5.—Sturtevant Sample Grinder No. 3.

is completely accessible, which is essential for assay work where it is necessary to thoroughly clean the machine after each sample has been dealt with. When closed, the doors are locked and firmly secured by means of a hand-wheel which prevents any possibility of give and ensures the machine being

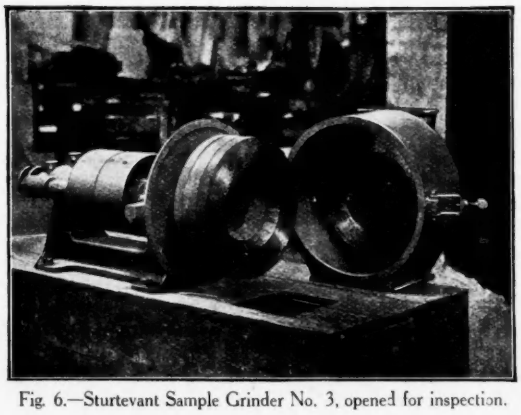

Fig. 6.—Sturtevant Sample Grinder No. 3, opened for inspection.

completely rigid. In operation, the jaws give the material a rolling crush, rolling over it and then dropping it without any clogging, unless, of course, the material is very sticky.

For the further crushing of the product from a laboratory roll jaw crusher, the Sturtevant crushing rolls will take ore

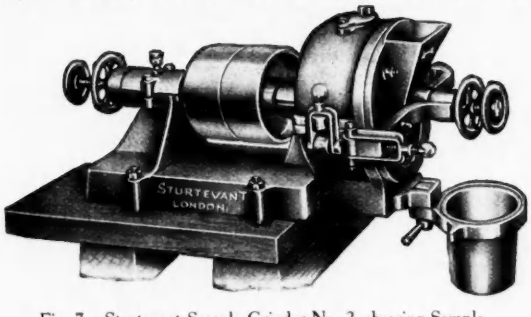

Fig. 7.—Sturtevant Sample Grinder No. 2, showing Sample Container swung out of position.

and hard rock, and reduce them rapidly and economically to a fine sand, as small as 60 mesh. The whole machine is practically dust-proof, and has special axle box bearings. It is fitted with an automatic feeder which spreads the material evenly over the surface of the rolls. Adjustable spring pressure enables perfect regulation for fine or coarse grinding, and should any uncrushable matter be accidentally fed into the machine, the rolls are protected against breakage by the springs, which allow them to open a momentary passage for the foreign substance to pass through. Complete accessibility is provided by means of the top cover, which is hinged and can be thrown back to expose the interior of the machine for inspection. The grinding capacity varies from 300 to 1,000 lb. per hour, according to the nature of the material being handled. Fig. 4 shows one of these crushing rolls with the cover raised.

Sample Grinding

Taking material approixmately pea size or smaller, a Sturtevant laboratory sample grinder (Fig. 5-6) will reduce it in one operation to practically any degree of fineness required for perfect sampling or correct assaying. The machine is compact, simple in design, and unrivalled for quick, fine accurate work. Grinding is done between manganese steel, buhrstone, or built-up carbonundum discs, which may be easily and cheaply replaced when they wear out. Fine and even

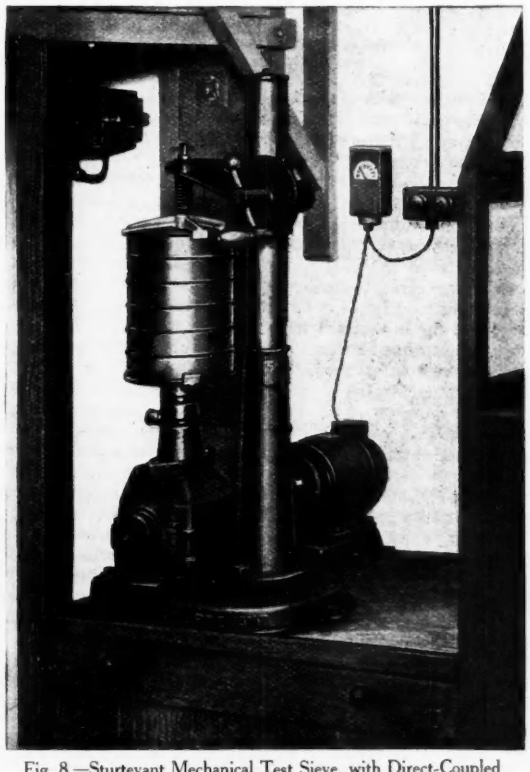

Fig. 8.—Sturtevant Mechanical Test Sieve, with Direct-Coupled Electric Motor.

grinding is assured, as any tendency for grooves or rings to form on the grinding discs can be corrected by moving the stationary disc out of centre and so alter the relative positions of the two grinding surfaces; simple means for making this adjustment are provided on the door of the machine. The adjustment necessary to obtain different sized fines is also easily made by means of a hand-wheel at the end of the driving shaft. Accessibility to the interior is provided by the stationary disc being mounted on a swing door, which can be securly closed by a clamp, so that the rigidity of the machine is not affected.

This sample grinder is made in two sizes, with grinding plates 10 in. and 14 in. in diameter, the power consumption being 3 and 5 B.H.P. respectively. The larger unit is fitted with more refinements than is possible with the smaller machine. For instance, the shaft runs in roller bearings, and an ingenious spring device prevents the discs being damaged should any ungrindable material gain access with the feed; this device actually enables the grinding faces to separate so that foreign material passes straight through the mill. The smaller unit (Fig. 7) can be fitted with a sample contained.

and which is swung into position beneath the discharge when the machine is working, so that there is no loss of valuable samples.

The Sturtevant mechanical test sieve (Fig 8) is one of the most important of laboratory machines, as it definitely overcomes all the doubts and objections attendant on hand seivings, whilst results are obtained very quickly and with great precision. It will deal with all samples in exactly the same manner by submitting them to the same number and strength of vibrations for the same period. The vibrating mechanism is set by a timing gear to operate for a pre-determined period, which can be anything from one minute to an hour. When this period has passed the timing gear comes into operation and cuts off the switch; the sieves then contain their respective gradings. The screens can be instantly changed when required. The machine will take half-a-dozen sieves at a time varying in diameter between 6 in. and 12 in.

In the design of their crushing, grinding and screening machinery the Sturtevant Engineering Co., Ltd., have given particular attention to means for easy accessibility to the interior of the machines. This is provided by an "open door" feature, which does not interfere with the rigidity of the machine, as adequate locking devices are provided. The value of this easy accessibility cannot be over-rated, as the cleaning of the mill is very often desirable in the course of experimental work and is sometimes essential in analytical routine.

Most of the machines made by the firm may be seen at work in their own laboratory, and batches of customers' materials can be dealt with.

Safety in the Pumping of Chemicals

By JAMES C. LAWRENCE

The author of this article is chemical engineer to E. I. Du Pont de Nemours and Co., of Wilmington, Del. He summarised the question of safety in chemical pumps and pumping machinery in an address delivered to the Chemical Section of the 21st Annual Congress of the National Safety Council, held at Washington, October 3-7.

THOSE familiar with chemical operations know the continual troubles experienced with loss and damage due to leakage, corrosion, and breakage of pumps which are handling chemical liquids. "Safety" in this connection is the prevention of direct accidents to men from such pump troubles, and the prevention of accidents caused indirectly by leakage, corrosion, and breakage.

In considering the question of safety as applied to chemical pumping operations it is necessary to guard workmen against two things. First, there are the contents of the pump which may cause injury by direct contact, or may cause explosion or fire by coming in contact with other materials, and secondly, parts of the pump itself may cause injury due to breakage or explosion. Each of these two hazards may come about in several ways. Probably the hazard most commonly met is that due to damage or injury by contents. Leakage of liquids at the glands of rotary pumps can readily form a fine spray or rain that may, in the case of caustic soda or acids, burn or blind an attendant. Gaskets may give way and under the pump pressure shoot a stream of liquid many feet on to an operator, or into contact with other materials that may readily cause fire or explosion. Leakage of a serious nature because of its volume may also be caused by serious corrosion of casings too far below their limit of strength. These corroded areas may suddenly give way on account of corroded valves sticking and consequent sudden fluctuations in pressure. Such leaks may cause several hundred gallons of liquid to be distributed on to men and materials alike in a very short space of time. The second hazard—that of injury due to bursting pumps and flying pieces—while not necessarily confined to chemical pumps is more liable to be encountered here on account of the general corrosion encountered in handling chemicals.

Preventing Leakage and Breakage

An example of injury due to leakage only was given by one plant on a pump handling a heavy inflammable solvent. Leakage around the gland sprayed into the air and collected on the floor, the attendant on going to the machine for lubrication arrived as a fire started, due to static or friction in the bearings. These pumps are now set over a shallow pit of water, so that any solvent leakage at once sinks to the bottom. In consequence of this no further fires have occurred. An example of injury due to breakage and leakage was in connection with a pump moving caustic soda from a tank on the ground floor to the fifth floor. The operator started the pump without opening the discharge valve, the pump burst and a stream of caustic shot across the room badly burning the foreman. Centrifugal pumps are ordinarily considered satisfactory to run against a closed discharge, but corrosion had certainly weakened this casing to such an extent that the pressure due to the closed valve exceeded the limit of strength of the metal body.

Having seen what happens to chemical pumps, and having decided what has to be guarded against in obtaining "safety" in connection with such equipment, it follows that certain steps should be taken to eliminate the hazards involved. Arriving at the present state of "safety" has involved a considerable amount of engineering and chemical study and design, a vast number of "cut-and-dry" installations, and a certain amount of economic study. Self evident, however, are the measures to be taken to prevent leakage and breakage accidents on pumps already installed. Glands should be shielded and drained, and pump casings shielded with sufficiently heavy metal to prevent flying liquid or parts from communicating beyond the pump area. In cases where fire hazards exist, pumps should be installed with explosion-proof motors in isolated rooms. In cases where extremely high pressures are required, where pumps handle liquids or vapours inflammable or explosive in themselves, suitably barricaded rooms should house the equipment.

Two Serviceable Pump Types

The ordinary chemical pump for caustic liquids, acids, solvents, and similar liquids at comparatively low pressures should be one of two types. There is the totally-submerged centrifugal, carried in the liquor tank itself; alternatively, the outside vertical type, having a pump barrel as high as the surface of the liquid in the tank. In both cases the worst feature of chemical pumps is eliminated, *viz.*, the stuffing box under liquid head. In the case of the submerged pump the hazard of breakage is also eliminated. Both types of pumps are available now for all heads and almost any depth of tank. In the case of the submerged type the hazard of leakage is transferred to the tank or container itself. While the cost of such installations is higher than for the ordinary pump, the elimination of hazards, maintenance costs, repairs, and shut-downs are sufficient to compensate for the added capital investment. Many pump manufacturers, it might also be pointed out, do not provide sufficient depth of stuffing box, nor sufficient metal in the bodies of chemical pumps. The chemical operator's attitude towards pumps is entirely different from that of the manufacturer. He is not particularly interested in pump efficiency as such, but primarily in the questions of how long will the pump stand up to his own particular job, how easily may it be repaired and repacked, and what it costs.

Summarising the position, it may be emphasised that the greatest hazards to be overcome in chemical pumps are from ordinary leaks at stuffing boxes and gaskets, and breakage from corroded or weakened casings. The number of actual injuries due to accidents or breakdown of chemical pumping equipment is probably low, but the potential hazard is always present on the normal unprotected pump. The continual damage and loss to industry in equipment, time, and material is extremely high when considered as a total. Most chemical pumping problems can readily be made reasonably safe from leakage and breakage by using submerged pumps or pumps having no gland against the liquid head; other pumps should be provided with properly protected glands and casings, water-cooled stuffing boxes, and where conditions call for it, isolated from the operating area.

The Future of the Dyestuffs Act

Third Report of the Dyestuffs Industry Development Committee

THE Dyestuffs Industry Development Committee has now issued its third report*, in which it recommends the continuance of the Dyestuffs (Imports Regulation) Act, 1920, on its present basis for a further period of three years. This Act, it points out, has helped to build up a very substantial dyemaking industry in this country. Many new dyestuffs have been put on the market, and as regards quality it is agreed there is little room for criticism of the standard maintained by the British output. In addition, a marked improvement has also been made during recent years in the service given by the makers to the users and in the technical co-operation between these two bodies.

Production statistics given in an appendix to this report show that the total output of dyestuffs advanced from 23,832,967 lb. in 1922 to no less than 55,785,032 lb. in 1929, the highest output recorded in any one year. There was a setback in 1930 when production declined to 42,590,243 lb., due, of course, to the depression in the leading colour consuming industries, which naturally meant that much smaller amounts of dyestuffs were required. Good progress was again made in 1931, when production reached 17,980,794 lb., an increase of 12½ per cent. over 1930. This expansion during a year of general economic depression is highly satisfactory. It is not possible to furnish complete figures of production for any portion of the current year, but so far as returns have been received from the dyestuffs makers, a further increase of about 25 per cent. is shown as compared with the production by the particular makers concerned during the corresponding period last year.

Notable Expansion in Vat Colours

Pre-war production of dyestuffs in this country amounted to only 22 per cent. by weight of the total consumption, and by 1928 the percentage had increased to 93 per cent. Since 1928 dyestuffs of domestic origin have represented from 90 per cent. to 93 per cent. of the total consumption of the country.

The acute world trade depression in the textile industries has meant that the demand for bulk colours has been less and consequently is reflected in a falling off during the past two years in the British production of indigo, the figures, for 1930 and 1931 being 6,550,456 lb. and 5,402,443 lb. respectively as compared with 12,019,258 lb. in 1929. On the other hand there has been an expansion in the output of vat colours which has increased from 281,279 lb. in 1922 to no less than 3,490,287 lb. in 1931. The development of the artificial silk industry has also been reflected in the output of dyestuffs for acetate silk, the output having increased from 227,501 lb in 1928 to 921,929 lb. in 1931 Formerly owing to the cost of dyestuffs and dyeing progresses colours of special fastness were only applied to the more expensive fabrics, but during recent years there has been a steadily increasing demand for coloured fabrics possessing special qualities of fastness. In consequence the amount of vat colours used has increased at the expense of the cheaper qualities formerly used.

Foreign Imports

As regards foreign imports, the quantity imported in 1931 was 5,074,974 lb. as against 3,934,127 lb. in 1928 an increase of 28 per cent. The biggest increases were in vat colours and dyestuffs for lake making. The increase in vat colours was parallel to the increase in the British production and results from the greater demand for colours of special fastness. Although there was no importation of dyestuffs for acetate silk in 1928, 118,765 lb. were imported in 1931. In this class of colour the British manufacturers were first in the market but certain foreign manufacturers have since produced patented colours for this trade. British manufacturers, however, are still predominant in this branch of the industry. Excellent progress is being made in the production of dyestuffs for the rubber industry, while dyestuffs for paper, confectionery and numerous other purposes are becoming increasingly important to the industry.

There has been a drop in the imports of dyestuffs during the first nine months of this year as compared with the first nine months of 1931, the figures being 3,653,328 lb. and 4,089,680 lb. respectively. With regard to intermediates, however, a considerable increase is shown in the imports during the first nine months of this year when the quantity imported was 125,552 lb. as compared with 60,368 lb. during the first nine months of 1931 This large increase is mainly accounted for the fact that there was a sudden large demand for dyestuffs early in the year due to improvement in the textile trade, and makers found it necessary to import quantities of intermediates to supplement their normal output in order to meet consumers' requirements for dyestuffs. The position has now been rectified, and in some instances, steps are being taken by the dyestuffs makers to enlarge their existing intermediate plant.

Average Prices for Dyestuffs

Investigations which were made in 1923 showed that the average price of dyestuffs before the war for all classes was about 1s. per lb., whilst during the war the average price reached the high level of 4s. 4d. per lb. By the year 1922, prices had fallen to an average of 2s. 6d. per lb., and in 1928 to 1s. 6½d. per lb. A further decline is shown in 1930 when the average price had fallen to 1s. 4¾d. per lb. During recent months the price of dyestuffs has risen appreciably and the average price during the first six months of this year again reached the 1928 level of 1s. 6½d. per lb. It is estimated that prices of individual dyestuffs disregarding the quantity sold have been raised on the average by about 22½ per cent. The dye makers contend that, in consequence of unrestricted competition, prices had reached an uneconomically low level during the latter part of 1930, and that they have found it necessary to increase prices to the level ruling prior to the reductions made in that year

The effect of the high prices of benzol and toluol in this country on the costs of dyestuffs is a matter which the dyemakers consider to require serious consideration. Although benzol and toluol of indigenous origin are not subject to the hydrocarbon oil duty of 8d. per gal., their value is largely governed by the ruling prices of petroleum spirit. The price of pure benzol in the United Kingdom to-day is from 1s. 10d. to 1s. 11d. per gal., which is considerably higher than the price ruling on the Continent and the United States of America. The difference which is approximately 10d. per gal. is a serious handicap to the British dyestuff makers when they have to meet world prices in dyestuffs and intermediates made therefrom. The dyemakers therefore suggest that steps should be taken to remove this disability either by an alteration in the system of taxation or motor vehicles or by some other means whereby they may be able to purchase benzol and toluol at prices not higher than their foreign competitors.

Co-operation in Research

During the past two years there has been no slackening of effort as regards research on the part of the dyestuffs makers and a considerable number of important novelties have been put on the market. These novelties represent the fruits of a policy of research and development which has been vigorously followed by various makers. Imperial Chemical Industries, Ltd., have developed a system of co-operation in research with eminent professors of organic chemistry. This has been done through the establishment of the Dyestuffs Group Research Committee and Technological Committee of Imperial Chemical Industries, Ltd. Researches on coal tar intermediates have been successfully carried out by the Department of Scientific and Industrial Research at Teddington under Professor G. T. Morgan, and the Department has to its credit the design and construction of a semi-works scale ether extractor, which is being successfully used on a works scale by L. B. Holliday and Co., Ltd., in the manufacture of resorcin, a valuable intermediate used in considerable quantities, not only in the manufacture of dyestuffs, but in the manufacture of synthetic resin employed for gramophone records.

*"Third Report of the Dyestuffs Development Committee, 1932." H.M. Stationery Office, 9d. net.

As regards the organisation of the industry, the tendency during recent years has been towards consolidation. Since 1928, this has been carried a stage further by the acquisition of the British Alizarine Co., Ltd., and Emco Dyestuffs Ltd., by Imperial Chemical Industries. The British Dyestuffs Corporation Ltd. and Scottish Dyes Ltd. had earlier been merged into Imperial Chemical Industries, Ltd., so that the greater part of the dye-making industry in this country is now under one control. Early in 1932, an agreement was reached between the I.G. Farbenindustrie (Germany), Society of Chemical Industry in Basle, Geigy Colour Co., Ltd., and the Sandoz Chemical Co., Ltd. (Switzerland), and the Nationale de Matières Colorantes (France) acting together, and Imperial Chemical Industries. Discussion towards this end had been proceeding at various times, and in view of the great expansion of dyestuffs manufacture since 1914, due to the efforts of several countries to establish domestic dye industries and the resultant surplus produced capacity, some agreement between the principal world producers was probably inevitable. The terms of the agreement have not been disclosed, but the Committee have been informed by a representative of Imperial Chemical Industries that it does not contain any provision which would impede or restrict the technical or scientific development of any of the companies concerned, nor does it comprise any selling price arrangements. The main object of the agreement was an endeavour on the part of the firms concerned to stabilise their share of the world trade in dyestuffs.

Conclusions and Recommendations

The chief conclusion reached by the Committee is that the Dyestuffs (Imports Regulation) Act, 1920, is achieving its main objects. In the absence of the Dyestuffs Act the progress of the dye-making industry in the United Kingdom would be impeded. British makers are now able to meet about 90 per cent. by weight of the home demand for dyestuffs, as compared with just over 20 per cent. in 1913. Export trade in British dyestuffs is making substantial progress, the value of the total exports in 1931 being the highest recorded since 1923. The recent consolidation of the British dyemaking industry has resulted in greater efficiency by the avoidance of unnecessary overlapping and by the concentration of effort. The effect of the recent agreement between Imperial Chemical Industries and the principal Continental dye-makers has yet to be seen, but there would appear to be no reason to anticipate that the agreement will result in a restriction to the activities or output of the British company.

In view of the foregoing conclusions the Committee recommend that the Dyestuffs (Imports Regulation) Act, 1920, be continued on its present basis for a period of three years, and that arrangement should be made for alteration in the method of taxation of motor spirit whereby British dye-makers should be able to obtain their supplies of benzol, toluol and xylol at prices corresponding to those paid by their foreign competitors.

Minority Report Urges Lapsing of Act

Accompanying this report is a memorandum from the representatives of the Colour Users' Association, which urges the lapsing of the Act at the end of the year. The memorandum, which has been prepared after consultation with the Council of the Colour Users' Association and with its unanimous approval, is signed by Sir Henry Sutcliffe Smith and Mr. Forrest Hewit. It stated that the statistics of production and export are ample proof of the remarkable progress made by the dyestuffs industry under the aegis of the Dyestuffs (Import Regulation) Act, 1920, during its full period of ten years and the subsequent period of nearly two years since January 15, 1931, when the Act was extended under the Expiring Laws Continuance Acts of 1930 and 1931. The association, however, is of the unanimous opinion that under the existing conditions the Act should not be extended after the end of his year. The colour users, it is pointed out, have loyally carried out their pledge to assist in the establishment of the industry. The agreement reached between the Imperial Chemical Industries and the Continental group of dye-makers constituting as it undoubtedly does a virtual monopoly, removes the necessity for the protection afforded by the Act, which, moreover, supplemented by the recently formed international cartel, prejudicially affects the industries represented by colour users.

Letter to the Editor

Graphical versus Algebraical Analysis

SIR,—Professor Armstrong, to whom I owe my early training as an organic chemist, pays me a compliment when he directs attention to exact measurement as a characteristic feature of the "stuff" with which he associates my name in your issue of November 19, p.472. Graphical methods, as commonly applied to physico-chemical problems, are notoriously inexact; and it is for this reason that, instead of being content with merely plotting curves, I have insisted so often on the necessity for making measurements of sufficient exactitude to stand up to the much sterner test of algebraic analysis. This discipline imposes a severe strain on those who are subjected to it; but it is just as important for the training of physical chemists, as experience in the separation and analysis of pure substances is in the training of organic chemists; and tables of measurements which have been submitted to this test have a permanent value, which is not possessed by data that have not been "hall-marked" in this way.—Yours faithfully,

T. M. LOWRY.

Laboratory of Physical Chemistry,
Cambridge University.

Oil & Colour Chemists' Association

Annual Dinner of Manchester Section

THE eighth annual dinner and dance of the Manchester Section of the Oil and Colour Chemists' Association was held in "The Manchester, Ltd." Royal Exchange on November 26, there being a large attendance, presided over by Mr. J. A. F. Wilkinson.

Mr. ELLIS GREEN proposed the toast "The Manchester Section of the Oil and Colour Chemists' Association," remarking that chemistry and chemists, to him, were subjects that were wrapped in mystery and thought, and, from his own experience and contact with chemists during the last ten or fifteen years, they appeared to be surrounded by an impenetrable smoke cloud of reticence. Whether that retiring attitude, that screen of obscurity, was a good thing either for the general public or the chemist was a matter of doubt, because if there was one thing that stood out more clearly than another in the industrial world of to-day it was the growing importance of the technical man. He did not think it was an exaggeration to say that the future prosperity of industry in this country depended very largely on its technical men, and on the extent to which the results of their investigations were adopted and put to practical use. He had often heard it said that chemistry was a key industry, from which he supposed it followed that trained chemists held keys that might unlock the doors to new industries and processes yet unthought of. It was the technical man who was able to see the potential importance of a new discovery or method and it seemed to him that an urgent need to-day was for more forethought and scientific planning in our industrial life.

Mr. J. A. F. WILKINSON, in responding, said he was very much struck with the very large attendance, which gave some indication of their progress. He was very pleased to hear of the move which had been made in co-operating with the different chemical organisations in Manchester. That seemed a very good scheme and he believed it was being followed in other large towns, notably Newcastle-on-Tyne.

Mr. A. HANCOCK proposed "Our Guests," to which Mr. Charles Gysin, of the Geigy Colour Co., Ltd., responded.

Atlas Artificial Silk Process

Compulsory Winding-Up Order

IN the Companies Court on Monday, Mr. Justice Bennett had before him a petition for the compulsory winding up of Atlas Artificial Silk Processes, Ltd.

Mr. Berber, for the company, said the company's offer had not been accepted and he could not oppose an order.

His Lordship: You cannot resist the order?

Mr. Berber: No.

His Lordship: The usual order.

British Association of Chemists

Fifteenth Annual Meeting and Dinner at Birmingham

THE fifteenth annual general meeting of the British Association of Chemists was held at the Midland Hotel, Birmingham, on November 26. Mr. S. Reginald Price, president of the Association, occupied the chair, and there was a representative attendance from London and the provinces.

The financial statement was presented by Mr. W. H. Woodcock, who stated that the surplus on income and expenditure account for the past year was £43 3s. Members' subscriptions showed an increase of £60, which he regarded as a healthy sign, because it was due to increase of membership. On the unemployment benefit fund there had been heavy demands. The amount paid was £1,540 compared with £915 in 1931. He regarded this work as of the utmost importance. The reserve fund was somewhat smaller than in the preceding year. Excellent work had been done by the legal aid fund, several important cases having been taken. The special aid fund was a real asset to the Association. They were not permitted to give any unemployed benefit to people who were unemployed through sickness, but by means of this fund they had made grants amounting to £30. They were gradually increasing the fund, and it was generally felt that the term " special aid " was preferable to the word "benevolent." The financial position of the association was healthy.

Increased Membership

In the annual report of the Council, the adoption of which was moved by the chairman, it was stated that the total membership is now 1,517. During the year 169 new members had been elected, which, considering prevailing conditions, compared favourably with the high records of the two previous years. Allowing for resignations, there was a net increase of 99 new members. Having regard to the importance of legal aid, the Council felt it essential to provide for all contingencies by consolidating this fund. The severe conditions of industrial depression had tested the work of the appointments bureau. It had been most useful in supplementing the work of the unemployment benefit fund in introducing positions to members before they had drawn their full 26 weeks' benefit. Many employers had approached the bureau direct.

The relations with Government departments were in every way satisfactory. The Ministry of Labour had, on numerous occasions, consulted the Association regarding applications for permits for aliens to occupy positions as chemists, with advice on the appropriate scale of salaries. In no case brought to their notice had a permit been granted where a British chemist could be found able to satisfy the requirements of the employers. With regard to legal aid, the department had had an active year. Numerous claims had been settled in full by negotiation, thanks to the excellence of the legal advice at the disposal of the Association. In one case £75 compensation was obtained for a probationer member who had been attacked by dermatitis as a result of his work. Efforts had continued towards registration and the publication of a register, but as a number of chemists still withheld sanction the register had had to stand over until a later date.

Tribute to the Staff

The chairman said it was a matter for satisfaction that despite the difficulties of the present day steady progress was being made by the Association. Only that morning 54 new probationers and members were elected by the Council. The financial position was sounder than it had ever been. Applications were being received by the appointments bureau on a better scale than formerly. Government departments had been very helpful whenever difficulties had been arisen about which they needed to consult them. It was the intention of the Council to consider the best means by which to make the " Chemical Practitioner " more valuable as the organ of the Association. He paid warm tribute to the work of the staff at headquarters and in particular to Mr. C. B. Woodley, general secretary.

On the motion of Mr. A. W. Knapp, the officers were elected as follows for the ensuing year: President, Professor E. C. C. Baly, F.R.S. (Liverpool University); vice-presidents, Sir Max Muspratt, Mr. W. E. Kay, Mr. C. S. Garland, Mr. J. Bristowe, Mr. P. Harrison, Professor I. L. Heilbron and Professor A. G. Green; hon. registrar, Dr. E. H. Rodd; hon. treasurer, Mr. W. H. Woodcock; hon. editor, Mr. H. T. F. Rhodes; and auditors, Messrs. Hughes and Allen, with the following members of Council elected by sections: Manchester, Mr. M. F. S. Choate, Mr. J. H. Dent, and Dr. J. Avery; London, Miss W. Wright, Mr. H. M. Morgan, and Mr. A. J. C. Cosbie; Liverpool, Mr. H. P. Minton, and Mr. G. C. Riley; Notts and Derby, Mr. E. A. Chapman; Birmingham, Mr. J. R. Johnson; Scottish, Mr. R. W. Dunlop.

Notice of a resolution suggesting an amendment of rules to read " Full members of British nationality only of under 65 years of age shall be eligible for participation in the benefits of this scheme " was withdrawn, as was also a notice of an amendment of rules emanating from Manchester, which was in the following terms: " The Association shall consist of full members, probationers and students of British nationality who may be of either sex, and who shall be admitted by the Council on the production of satisfactory evidence of the necessary qualifications."

Alien Chemists

Mr. J. R. JOHNSON (Birmingham) suggested that further consideration should be given by the Council to the question of the membership of alien chemists, and the payment of unemployed benefits to members not resident in this country. In a brief discussion there was a divergence of opinion on several of the matters raised, and Mr. C. S. Garland said this fact strongly supported the case for consideration by the Council. The meeting approved of this arrangement.

The CHAIRMAN, in discussing prevailing conditions, said in his opinion the world was not suffering from over-production but from under consumption. The time as coming when increased attention would need to be given by chemists to the question of real co-ordination of scientific thought. His own feeling was that things were beginning to move in this direction, and his hope was that chemists would take a big view of the position.

Professor BALY, acknowledging his election as president, said his own opinion was that our troubles to-day were not due to over-production or under consumption, but to bad distribution. A chemist needed to have a wider vision, and with that the progress of the Association must come. If there were to be a merging of the scientific societies of this country, a great difference would be made to the position of the Association. He was satisfied that it had a great future, because it possessed the power to give to chemists help in a material way as distinct from knowledge and theories, valuable, of course, as they were. They could deal with the realities of life, because it was obvious that no man could do his best work if financial worry was nagging at his heart.

The Annual Dinner

Mr. REGINALD PRICE presided at the dinner in the evening, and submitted the toast, that of " The Association," with which were coupled " The Guests," " The University of Birmingham " and " Chemical and Kindred Societies." The Association was, he said, pleased to have the support of so many representative people and the co-operation of representatives of the Chemical Society, the Institute of Chemistry, the Society of Chemical Industry and of other organisations representing the applications of chemistry.

Professor BALY, in reply, said the Association could look back upon 15 years of steady progress. It was an excellent achievement to have enrolled nearly 1,600 members. The work of the Association with regard to legal aid was invaluable, as the results of litigation and of negotiation had shown. The Association was being listened to in places that really mattered. He could not help feeling that the Association suffered from a kind of inferiority complex because of the attitude of the Institute of Chemistry at the time it was started. He was now inclined to the view that the whole question of qualifications of entry into the Association might

be reconsidered. As regarded qualifications of entry, the one thing he had learned was that there was no harder critic than the men who had just joined a society. There was the danger lest the views of some should be a little too severe. "I have a good reason for believing," he added, "that the time is not far distant when there will mature a scheme for the amalgamation of all the scientific societies interested in chemistry —the Chemical Society, the Institute of Chemistry, the Society of Chemical Industry, the Faraday Society, and others. I believe that may come in the near future and the question is—'What is to be the attitude of the British Association towards such a movement?' The proposal is that this new combined society shall have all the powers as to qualifications, and that membership shall have a definite qualification. There is the possibility of the British Association asking in the politest way, possibly with a certain amount of force, to come in. If they do, then one can visualise a new ideal—that of an association—possibly with the title of 'Royal' —which shall have the power of defining the qualification of chemists and at the same time of ensuring help to those who may lose their jobs. I think one can see, in this, the realisation of the ideals of every one of us—that we should have the sole power of giving benefits in return for contributions."

Sir CHARLES GRANT ROBERTSON said the University of Birmingham had always attached the utmost importance to chemistry and physics, because they were basic sciences dealing with fundamental facts upon which scientific education and training must be based. In the present University of Birmingham, as in its predecessor, Mason's College, the heads of the department of chemistry had been men of great distinction—Tilden, Frankland, Morgan and Haworth. There were many able chemists occupying important positions, both in this country and overseas, who were trained at the Birmingham University.

Dr. E. F. ARMSTRONG, replying on behalf of "Chemistry," said that if a man wished to become a chemist, he must have chemistry in his heart. To be a successful chemist many qualifications were demanded because it was one of the widest and most difficult of subjects, and if he were to approach the top of the tree, he must have a large amount of culture, and be a keen student of the new science of management. His training must provide for honesty, accuracy and caution.

Professor G. T. MORGAN, replying for kindred societies, congratulated the British Association on its wonderful record of progress. He described the Chemical Society as the glorious heritage of British chemists. The Society of Chemical Industry, of which until recently he was president, had long had local sections, and it was now developing in another direction by forming subject sections. It had long had the Chemical Engineering Group and now there had been added new groups devoted to food and plastics. He anticipated further developments of a similar character. As regarded the British Association in relation to the Institute of Chemistry, he thought it was quite a mistaken idea to suggest that they had an inferiority complex. They had always felt themselves on a level with the Institute, and it was important that the two bodies should come into closer collaboration. During the two years he was president he had occasions to look at the qualifications of the members. Over 30 per cent. were either fellows or associates of the Institute. Over 30 per cent. were qualified to join the Institute if they cared to by paying the extra subscription, and with regard to the other 30 per cent. his own feeling was that when the question of amalgamation arose the Institute should waive the strict qualification so as to enable those men to affiliate themselves with the Institute. The physicists had adopted a similar policy of merging. As to the unification of the chemical associations, the negotiations were delicate at this stage.

Above all things they must agree with one another on some broad basis before they could hope for amalgamation. The Chemical Society and the Society of Chemical Industry had co-operated in the "Bureau of Chemical Abstracts," which were amongst the best in the world, and it was quite possible those societies might publish joint transactions. The Chemical Society and the Faraday Society were considering the question of forming a joint journal of physical chemistry. If it were possible to secure the closer co-operation and working of societies in the direction hinted at, the chemists of this country would be able to deal with matters other than at present and be able to speak with a united voice. That would never be done with the present multiplicity of societies and it was well to remember that at least three societies connected with chemistry were trying to do much the same thing.

Mr. JOHNSON also replied to the toast on behalf of the Birmingham Branch of the Association, and on the proposition of Mr. Garland, the toast of the officers of the Association was duly honoured. He paid tribute to the efficient work of the general secretary.

The Institution of Chemical Engineers

Annual Reception

THE annual reception of the Institution of Chemical Engineers was held at Claridge's Hotel, London, on November 24, and fully maintained its tradition as one of the most brilliant social functions associated with chemical interests throughout the year. Viscount Leverhulme, president of the Institution, accompanied by Viscountess Leverhulme, received about 500 guests. Inaugurated in 1925, the reception has grown in popularity each year, and the assembly on this occasion was one of the largest on record. Following the formal reception, dancing was enjoyed and light refreshments were served. Among those who accepted invitations to be present were the following:—

Hon. H. Fletcher Moulton, Sir Ernest and Lady Benn, Sir Hugo and Lady Hirst, Sir Alexander Gibb, Sir Frank and Lady Heath, Sir Robert and Lady Robertson, Sir Harry and Lady McGowan, Sir Frederic and Lady Nathan, Sir William Bragg, Sir Robert and Lady Waley Cohen, Sir John and Lady Flett, Sir James and Lady Henderson, Sir Samuel and Lady Instone, Sir John and Lady Russell, Sir Francis and Lady Goodenough, Sir Ernest Graham-Little, M.P., and Lady Graham-Little; Mr. and Mrs. E. A. Alliott, Dr. and Mrs. E. F. Armstrong, Professor H. E. Armstrong and Miss Armstrong, Mr. and Mrs. H. Ballantyne, Dr. and Mrs. S. G. Barker, Dr. F. Bergius, Professor W. A. Bone and Miss Bone, Professor and Mrs. J. S. S. Brame, Mr. and Mrs. C. C. H. Brazier, Col. and Mrs. E. Briggs, Professor and Mrs. H. V. A. Briscoe, Mr. W. J. A. Butterfield, Mr. and Mrs. W. A. S. Calder, Dr. and Mrs. H. T. Calvert, Dr. and Mrs. F. H. Carr, Mr. and Mrs. S. E. Carr, Dr. and Mrs. C. H. Clarke, Dr. G. C. Clayton, M.P., and Mrs. Clayton; Mr. W. H. Coleman, Dr. and Mrs. R. T. Colgate, Mr. R. Leslie Collett, Dr. D. Jordan Lloyd, Mr. and Mrs. H. W. Cremer, Professor and Mrs. J. A. Crowther, Professor F. G. Donnan, Mr. and Mrs. R. Edgeworth-Johnstone, Dr. H. J. T. Ellingham, Mr. and Mrs. E. V. Evans, Mr. K. Evans, Dr. and Mrs. J. Vargas Eyre, Mr. and Mrs. John Ferguson, Major and Mrs. F. A. Freeth, Mr. and Mrs. C. S. Garland, Professor and Mrs. W. E. Gibbs, Mr. and Mrs. C. J. Goodwin, Mr. and Mrs. W. D. Graddon, Mr. and Mrs. G. Gray, Mr. and Mrs. F. A. Greene, Dr. E. Griffiths, Dr. W. H. Hatfield, Mr. and Mrs. W. B. Heaton, Dr. H. S. Hele-Shaw, Mr. and Mrs. G. W. Himus, Dr. and Mrs. P. C. C. Isherwood, Dr. and Mrs. L. A. Jordan, Mr. and Mrs. J. Kewley, Dr. and Mrs. J. G. King, Dr. and Mrs. R. Lessing, Dr. and Mrs. H. Levinstein, Mr. and Mrs. J. MacGregor, Mr. W. Macnab, Mr. and Mrs. R. M. Macnaught, Dr. G. W. Monier-Williams, Dr. and Mrs. H. Moore, Dr. D. M. Newitt, Mr. and Mrs. H. Nielsen, Dr. and Mrs. W. R. Ormandy, Mr. and Mrs. P. Parrish, Dr. and Mrs. R. H. Pickard, Mr. and Mrs. R. B. Pilcher, Mr. and Mrs. Eric Reavell, Mr. and Mrs. J. Arthur Reavell, Professor and Mrs. A. Robertson, Mr. and Mrs. F. H. Rogers, Engr. Captain J. Fraser Shaw, Dr. and Mrs. F. S. Sinnatt, Mr. and Mrs. H. Talbot, Professor and Mrs. J. F. Thorpe, Mr. W. A. Tookey, Dr. Phyllis Tookey-Kerridge, Mr. and Mrs. S. J. Tungay, Dr. A. J. V. Underwood, Mr. and Mrs. S. G. M. Ure, Professor R. V. Wheeler, Mr. C. B. Woodley and Miss Wright.

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"Physical Atomic Weights"

The Chemical Society Meets at Birmingham

UNDER the auspices of the Chemical Society the fourth Liversidge lecture was delivered at the Birmingham University on Friday, November 25, the lecturer being Dr. F. W. Aston, F.R.S., who spoke on "Physical Atomic Weights." The meeting, which was attended by 300 chemists from the Midlands and undergraduate members of the Chemical Department of the University, was in the nature of an innovation. The Chemical Society, founded in 1841, is the oldest of its kind in the world, and this was the first time on which it has held a formal scientific meeting outside London. Professor J. F. Thorpe, of the Imperial College of Science, London, presided in the absence of Professor Henderson (Glasgow), president of the Chemical Society.

Dr. Aston, in discussing the question of physical atomic weights, gave the results of his investigations of the mass spectra and the isotopic forms of the elements. In determining the atomic weights of the elements, he pointed out that the chemist deals with the relative masses of millions of atoms and obtains average values for his fundamental constants. His investigations have shown that all the atoms of a particular element are not necessarily identical with each other. Those of many common elements have proved to be of two or more kinds, differing in their relative masses, but having identical chemical properties. These constitute what are described as isotopic forms or isotopes of the elements. In nature these different kinds of atoms of a particular element are usually so intimately mixed that different specimens of an element have generally the same statistical atomic weight as determined by the chemist.

Photometry of Mass Spectra

Describing the methods by which he obtained the true atomic weights, Dr. Aston said that while they exhibit striking regularities and still more interesting irregularities, important information concerning the structure of the core or nucleus of the atom has been obtained. As the majority of elements are complex, in order to determine the mean atomic weight he worked out a method of measuring the relative abundance of the isotopes by the photometry of mass spectra. While it is impossible to obtain a mixture of elements which may be regarded as a fair sample of cosmic matter, it is very nearly as impossible to obtain a mixture of isotopes which is not a fair sample of a complex element. One great difficulty with the photometry of mass spectra is that the source is never reproducible and seldom constant for more than a very short time. Another is that the relation between abundance and blackening of the plate is completely different for different elements. For the preliminary work krypton was taken as the most suitable standard element, because it has six isotopes with a good range of abundance and which are easy to resolve. It works well in the ordinary vacuum discharge, and when mass rays are produced in this way it is safe to assume that the proportion of the isotopes in the beam will be absolutely invariable. The experience gained with krypton was of great value in extending the work to other elements.

The physical value for boron is probably low on account of the enhanced photographic effect of its lighter isotope. Scandium, niobium and tantalum are shown by their mass spectra to be essentially simple, and there seems little doubt that their chemical atomic weights are too high. The same is true, but to a less degree, of phosphorus. The first physical value for zinc was identical with the chemical one, but Bainbridge has since showed that hydrides were present.

Comparison of Physical and Chemical Values

The serious difference in the case of solenium has been removed by Honigschmid, who, in his latest revision, gets a value identical with the physical one. The first value for tellurium was obtained under difficulties and now a better mass-spectrum analysis has been achieved by Bainbridge, who discovered three new light isotopes. Support of the high value for krypton has led to the International figure being raised. The latest density determinations, made by Whytlaw-Gray by means of a micro-balance, gives 131.26, which is identical with that obtained by the photometry of its mass spectrum. On the other hand, the physical value for osmium makes it very difficult to accept the figure 191.55, recently suggested by Gilchrist. Contrary to expectations its mass spectrum shows uranium to be at least 07 per cent. of 238. It has not yet been possible to measure its packing fraction, but it appears very improbable for it to have a positive value high enough to agree with the present chemical atomic weight 238.14.

Professor W. N. HAWORTH (Chemical Department, Birmingham University), in moving a vote of thanks to Dr. Aston, said the subject of this lecture was fundamental to chemistry, and there could be no results of greater value to the working chemist in every detail of his work. The accuracy with which atomic weight values could now be determined by purely chemical means had resulted in a great gain to chemists.

Professor G. T. MORGAN (late president of the Society of Chemical Industry), seconding the resolution, said that meeting was a red letter day in the history of the Chemical Society, as that was the first time it had come into the provinces. In a chemical paper a distinguished contributor (Professor Armstrong) had recently suggested that the Chemical Society was moribund. He thought that what Professor Armstrong really meant was that it was the Council rather than the Society that was moribund. As a member of the Council, he was willing, for the sake of argument, to accept that impeachment, but he did not think it was quite fair to apply it to the Chemical Society as a whole. Last December there were 3,775 Fellows of the Chemical Society and only 136 had been on the Council, and 1,180 Fellows had, at some time or other, contributed to the transactions or proceedings. The Chemical Society had, during the past 90 years ,done wonderful research work, and his hope was that the recent indictment would not be taken too seriously. The present meeting indicated that the society was entering upon a new lease of life. Nine years hence it would attain its hundredth birthday, and from all parts of the world representatives of learned societies would attend the celebrations and offer their congratulations.

Dr. Aston was later entertained to dinner, the chair being taken by Professor Haworth.

Preservation of Timber

An All-British Creosote Film

EARLY this year members of the timber trade saw a film exhibited in London, under the auspices of the Association of Tar Distillers, which was designed to illustrate and emphasise the value of preservative treatment of wood. It was a foreign film, and it dealt with the destructive activities of wood boring insects, showed the manufacture of creosote oil, and depicted methods of impregnation. Now a new British film with notable additions, arranged in a form suitable for public exhibition, is available. This film was shown to members of the timber trade at Film House, Wardour street, on November 23. "The Story of British Timber" is its title, and it goes through from the stages preparatory to planting, to forestry work, felling, carting and conversion to railway sleepers, telegraph poles and fencing, to the creosoting process, and ends with pictures of comparative tests on timber structures treated and untreated with fire resistant.

Mr. Henry Dobinson asked members of the Timber Trade Federation present to bear in mind that the film had been produced by the British Wood Preserving Association with the help of the Forestry Commission. It was natural, therefore, that outstanding features were forestry and creosoting, but now the Timber Trade Federation might consider the possibility of adding to the film in any way that may seem good to them on behalf of timber generally. The film had been put into a form which it was thought would fit in for general public exhibition, and it was hoped that this exhibition would take place early in the new year, at the same time as the secretary of the British Wood Preserving Association gave broadcast talks on wood preservation. When the film was shown to technical audiences, it could be accompanied by a lecture given in person by a competent expert.

British Celanese, Ltd., v. Courtaulds, Ltd.

Artificial Silk Patents—Case for the Defence

IN the Chancery Division on November 24, Mr. Justice Clauson continued the hearing of the action by the British Celanese, Ltd., against Courtaulds, Ltd., for an injunction to restrain the defendants from infringing certain letters patent and damages and other relief. Defendants denied having infringed the letters patent and said they were invalid and they counter-claimed for revocation.

Sir Arthur Colefax, K.C., Mr. Craig Henderson, K.C. and Mr. E. J. Neep appeared for the plaintiff company, and Mr. James Whitehead, K.C., Sir Stafford Cripps, K.C., Mr. Trevor Watson, K.C., and Mr. G. Tookey for the defendant company. Mr. L. W. Heald held a watching brief on behalf of Cellulose Acetate Silk Co., Ltd.

His lordship inquired if Mr. Craig Henderson was saying that downward spinning was old or new in the art. Did he say that it had been suggested, but in an improbable form?

Mr. Henderson replied that as to the state of the art it had never been introduced or been put in practice. Pressing liquid through a hole *per se* was not new, but what he was concerned with getting by downward spinning was a continuous filament through a hole completely solidified by evaporation.

His lordship said he was oppressed by a recollection of the sausage machine case.

Mr. Henderson said there was a distinction between the two cases. In the sausage machine case there was a machine for mincing meat and another for filling sausage skins. The inventor placed the two in series.

His lordship: You quite understand why that case has been a nightmare to me during your argument.

Filament Solidified by Evaporation

Mr. Henderson pointed out that there was the widest difference between the two cases. Plaintiffs were producing a continuous filament which was solidified by evaporation. They were the first to get a completely dry filament by evaporation and that combination followed by the twisting and winding constitutes an inventive step with the valuable result of enormously increased speed. It was true cap spinning was old and had been known for one hundred years. It was not used in the real silk industry in the operation directly analogous to plaintiffs' process of manufacture. In the cotton industry where they were dealing with a cellulose commodity it was not used. It was tried and abandoned. In the woollen and worsted industry, where they were not dealing with a like material, but with animal fibres, it was used but only for particular classes of wool and worsted and not for the finest types.

Mr. Whitehead, K.C., in opening the case for the defendants, contended that all the plaintiffs had done was to patent something which occurred as it were in the natural and inevitable development of the art, although he would not say the first patent was in exactly the weak position as the third one. The case with regard to the cap spinning device was a remarkable one. There was no conflict between the parties as to the age of the cap spinning device. Anyone could go and purchase such a device where he liked without infringing anybody's monopoly. He knew no proposition of law which could be cited in support of a monopoly, which would prevent the person from using that device upon any material he chose to select. The fundamental fact of the case was that here was an attempt to uphold a monopoly which would restrain someone from using a device one hundred years old almost to a day and using it in the old way without the slighest modification having been made. To suggest that there had been no analogous used in the cap spinning machine was to say something which could not be supported.

Dealing with downward spinning counsel said plaintiffs were making a gallant attempt to find invention in the idea of extruding downwards which admittedly was an old idea.

Coming to the question of common general knowledge on the art, counsel said the case was a curious one. At the date of the patent the only people concerned with the acetate industry were the plaintiffs, and what was common general knowledge might only be known by three or four people. What was common general knowledge in chemistry would not be known by every chemist just as his learned friend might not know about the laws of England.

His lordship observed that they might not know what a sinecure rectory was, but he had to consider the matter recently.

Mr. Whitehead replied that he would leave his learned friend Sir Arthur Colefax to deal with that.

High Speed Method of Producing

On Friday, Mr. Whitehead resumed his opening for the defence, and said when the Court adjourned he was about to remind his lordship of the way in which he understood the plaintiffs put their case. He had referred to certain answers given by Mr. Swinburne in which he had dealt with what he ventured to call the three elements of the claim—claim of the first of the patents. Mr. Swinburne was asked to state what he considered to be the invention described and he referred the matter back to the claim which gave the main features of the process. The way in which the case had been put was substantially thus. It was said that the process involved was by steps. Importance was attached, as counsel understood it, to this assertion that each feature co-operated with other features of the process, and that it was the result of that which gave the high speed connection or method of producing what was said to be a valuable product.

It plainly was a matter of importance for the plaintiffs to establish as far as they could that there was that measure of co-operation which they asserted. Equally it was of some consequence for the defendants to ask his lordship to kindly inquire into the nature of these alleged co-operation. The first point was that his lordship would recollect in the casing the filament was dried by an evaporative process and the first question which would occur to his lordship's mind would be what was the relationship, if any, between this evaporative process and the direction of the spinning. His lordship would find there was no relationship in any direct sense. He meant that one got evaporation taking place in the same way, and under similar conditions whether the direction of spinning was upwards or downwards. The specification of plaintiffs' cap spinning related to either upward spinning or downward spinning and it said that so far as the apparatus was concerned it could be inside or outside the casing. His case was that evaporation would take place either way, downward or upward spinning.

Squirting, Drying and Hardening

The next point was the novelty or otherwise of this process. He argued that it was an old idea thought of long before plaintiffs' first patent. As to the totality of the process, squirting and drying and hardening by evaporation in a casing and continuous winding of the product was a very old idea. Drying was sufficient in the case of nitro-cellulose and cellulose acetate; although drying had been greater with the cellulose acetate than the nitro-cellulose. The specification admitted the process was old he submitted.

Continuing, counsel remarked that he would take some considerable time in opening the defendants' case.

His lordship said counsel could take the course he found most convenient. Having regard to the number of days that the Court had already been engaged in the case, one day more or less was immaterial.

Mr. Whitehead, passing on to the production of natural silk, explained how the silk was taken from the cocoon, which was placed in warm water. It was thought at one time, he added, that the silk worm was indigenous to China, but it was introduced to France, where a great silk industry sprung up. That industry was nearly ruined 50 or 60 years ago by a disease the cause of which Pasteur discovered. That was the beginning of the hero worship which he so well deserved from France and from the world. He added that no patent rights existed which would prevent nitro-cellulose being spun downwards by any one.

His lordship asked if he were right in his facts when he said that viscose had driven nitro-cellulose out of the market

and that nitro-cellulose had left the market as compared with cellulose acetate.

Mr. Whitehead said that was what the plaintiffs' said, as far as he knew there was only one factory making nitro silk and that was in Virginia, United States. He was not aware that the plaintiffs were using the process now.

On the evidence it was clear that there was no acetate silk industry until after the war. The only evidence of acetate silk manufacture at all was to be found in the prospectus which he had brought to the notice of the Court. Then they had the invention. There was positive evidence here of excess raw material arising from war conditions which contributed to the starting and success of the acetate silk industry, and he could conceive no more remarkable circumstance.

It was said that necessity was the mother of invention, but he would say that necessity was not the mother of invention, but necessity obviated invention or the possibility of invention, having regard to other facts of which there was evidence before the Court.

On the point as to the specifications or patents his lordship said in his view they threw some light on the events of the case and he could not rule out that evidence as irrelevant and accordingly he would admit the certificates of the specifications which would show what were the specifications between the two crucial ratio, and that they were drawn to the notice of the plaintiffs.

No Inventive Step in Downward Spinning

His submission was that there was here no patentable subject matter in the plaintiffs' inventions.

On Monday Mr. Whitehead, K.C , resumed his opening of the defendant's case. He argued that the prior documents proved that there was common general knowledge prior to the rate of patents of the subject matter in which they dealt.

The plaintiffs' specifications expressly covered the manufacture of nitrocellulose silk and it was admitted that it was common general knowledge to spin nitrocellulose in an evaporative process in a casing and to use as the evaporative medium, warm drying air. It was no inventive step, he added, in downward spinning, which plaintiffs had earmarked as the source of such a step. He also contended that there was no connection between high speed and spinning downwards, as plaintiff had suggested was the case.

On Tuesday, Mr. Whitehead, resuming, quoted from a speech by Mr. Arthur Chamberlain, deputy chairman of the plaintiff company in 1922, stating at a meeting of the shareholders that their process was not then a commercial one and that it bristled with problems.

On Wednesday, Mr. Granville Hugh Baillie, consulting engineer, was recalled for the plaintiffs, to give evidence as to certain experiments which he had seen carried out at Spondon. There was a spinning speed of 100 metres a minute and a bobbin speed of 7,000 revolutions a minute. When the lubrication was stopped some of the filaments were broken and some were not smooth.

He also said that in the experiments with respect to Clark's specification, one of the prior documents put in by the defendants, the dope used was not that referred to in the specification.

An Impossible Dope

Sir Arthur Colefax, K.C.: What Clark describes is an impossible dope; you cannot make it and therefore this cannot have been Clark's dope.

His lordship observed that the experiment would appear to have been a waste of time.

Sir Arthur said that Mr. James Swinburne, plaintiffs' expert witness, did not know what the dope used was and they did not know yet, except that it was put forward as something Clark described. Plaintiffs said that a dope such as the one described was an impossibility.

Mr. Baillie was asked whether he thought the experiment in question carried out Clark's specification, and he replied, "No, quite apart from the question of dope the apparatus was not consistent with Clark's description."

Mr. Trevor Watson, K.C., for the defendants, put in as an exhibit a sample of untreated viscose obtained in one experiment and remarked that although it might decompose perhaps it would do so before it became of use to anyone.

His lordship: It may be useful to have that in the shorthand note. Exhibits have been known to disappear before.

The hearing is proceeding.

The Paint Industry and Tariffs

Meeting of the National Paint Federation

THE programme of meetings arranged for members of the National Federation of Associated Paint, Colour and Varnish Manufacturers was successfully carried through last week, and a larger number of members attended than usual. The main business of the session was chiefly concerned with matters of domestic interest in regard to the various sections of the industry. The implications of tariffs and the Ottawa agreements took up much time and it was decided to press immediately for admission to the free list of certain of the main raw materials which are not produced within the British Empire. Wood oil, rosin and copal gums are three of the most important items in this category. A sub-committee was appointed to draw up a suitable drawback scheme applicable to such articles as are not free listed. If the Indian agreement is ratified, linseed oil will be one of the most important items to be dealt with immediately.

At the annual meeting of the National Joint Industrial Council, Mr. J. A. Dew (Sissons Brothers and Co., Ltd.) was elected the new chairman, and Mr. A. G. Parker, representing the Workers' Union, vice-chairman. The transport committee, under the chairmanship of Mr. S. J. Hann, reported some useful concessions negotiated with the railway companies. At the export section meeting, Mr. J. Burrell (J. Burrell and Co., Ltd.) resigned the chairmanship after six years in office and is succeeded by Mr. G. C. Longstaff (Blundell, Spence and Co., Ltd.). It is likely that the committee watching over the interests of this section of the trade will be kept busy during the next few years. Already representations have been submitted to the Government preparatory to the trade negotiations pending with Norway, Sweden, Denmark, Germany and Argentine.

During the week the annual general meeting of the Research Association of British Paint, Colour and Varnish Manufacturers was held. Mr. G. le M. Mander, M.P. (Mander Brothers, Ltd.), was re-elected president, and Major J. G. G. Mellor (Walpamur Co., Ltd.) and Mr. Oliver Wilkins (Oliver Wilkins and Co., Ltd.) the vice-presidents. The Association of Cellulose Lacquer Manufacturers also held its annual meeting and here a change in the chairmanship was made, Mr. A. J. Quig (Nobel Chemical Finishes, Ltd.) succeeding Mr. A. J. A. Wallace Barr (Cellon, Ltd.).

The shareholders of Tung Oil Estates, Ltd., were called together for the statutory general meeting and an interesting and promising report was given by Mr. H. J. Forbes, the general manager of the estates in Burma, who during his leave from Burma had paid a visit to the Tung estates in Florida. Mr. S. Romilly Hall gave a review of the work of a committee that is investigating the possibilities of launching a co-operative advertising programme in 1934, and it is hoped sufficient support will be forthcoming.

There was a short interlude during the Thursday afternoon session, when a presentation of a presidential badge of office was made to the Federation by Mr. T. Day on behalf of the Bristol Association, as a token of appreciation of the honour to be conferred upon Bristol by the appointment of Mr. S. Romilly Hall to the presidency of the Federation. The generosity of the Bristol Association was duly acknowledged in a unanimous resolution of thanks passed at the meeting of the newly appointed council on Friday morning, at which Mr. T. F. Spence (T. and R. Williamson, Ltd.) vacated the presidential chair and Mr. S. Romilly (J. Hall and Sons, Bristol and London, Ltd.) was elected president, Mr. S. R. Hadfield (Hadfields (Merton), Ltd.) senior vice-president, and Mr. A. P. Beven (Goodlass, Wall and Co., Ltd.) junior vice-president. Mr. H. J. Jones (Hemingway and Co., Ltd.) will continue to act as hon. treasurer.

News from the Allied Industries

Sugar

CURTAILMENT OF PRODUCTION of sugar on the basis of the average for the last five sugar crops is ordered by the Brazilian Government in a decree issued on November 29.

Calico Printing

JAPANESE COMPETITION, which threatens to have a serious effect on the printing cloth trade, is receiving the attention of leading calico printing concerns in Lancashire. It is stated that a Japanese firm with offices in Manchester, has been canvassing manufacturing merchants to send cloth to Japan in the grey state, have it printed there, and then export it to other markets. Japanese printing charges are much lower than those of the Manchester firms, and by this means, a merchant is enabled to send cloth half-way round the world and still sell it at prices cheaper than if the printing had been done in Lancashire.

Iron and Steel

THERE HAS BEEN A LULL in trading in the iron and steel markets, according to the official report of the London Iron and Steel Exchange. This is generally attributed to uncertainties arising from the debt repayment discussions and fears of their effect upon international trade. Business in pig-iron has been steady, but confined to small parcels to meet near requirements. The recent tendency to contract forward has disappeared. In the semi-finished steel department trading has also become quieter, but most of the business transacted has gone to the British works. Continental prices have shown signs of weakness, but this has not stimulated business. In the finished steel section of the market similar conditions prevail and business appears to have relapsed into a state of apathy, both buyers and sellers awaiting developments.

Non-Ferrous Metals

THE INTERNATIONAL COPPER CONFERENCE opened in New York on November 29. Sir Auckland Geddes is attending it. The conference will discuss the disposal of electrolytic stocks and the curtailment of output by the renewal of the restriction agreement which expires on December 31. It is probable that an international cartel to regulate selling and fix prices will be formed.

THE OCTOBER TIN EXPORTS, according to a statement issued by the International Tin Committee, show increases over September for Bolivia, Malaya and Siam, but decreases for the Dutch East Indies and Nigeria. At November 1 the Dutch East Indies had a deficiency of 56 tons, Nigeria a deficiency of 57 tons, and Siam a deficiency of 554 tons. But Bolivia and Malaya had excesses over the quota of 1,280 tons and 267 tons respectively.

Matches

AT AN EXTRAORDINARY GENERAL MEETING of shareholders of Bryant and May Ltd., in London, on November 24, a resolution authorising the directors to create new debenture stock for the proposed conversion of the 5 per cent. debentures into new 4 per cent. debentures was passed unanimously. The 5 per cent. stock will be redeemed and cancelled on March 31 next. Applications for conversion must be received by the company by December 14.

A PROPOSAL TO REDUCE the share capital of the Swedish Match Co. to 90,000,000 crowns (£5,000,000 at par), the nominal value of each share to be 25 crowns, was accepted by the shareholders at a meeting specially convened on November 29 to consider the administrators' report. The report, which contains a detailed scheme for the future organisation of the company, proposes that the moratorium granted after the Kreuger crash should not be prolonged. British shareholders are to nominate two out of twelve members of the controlling board, which is to adminster the company's profits. The two chosen are Mr. Walter Carter, of East Grinstead, and Mr. George Leonard Lambert, of London. Six of the other members will be nominated by the creditors, one by the Continental shareholders, and three by the Swedish shareholders. The company is to pay 6 per cent. interest on its debt, and a certain amortisation, dependent on the annual earnings.

Whale Oil

NEGOTIATIONS ARE IN PROGRESS between Norwegian whale-oil producers and some unnamed buyers, for the sale of the rest of this season's production, which amounts to about 280,000 tons.

Artificial Silk

THE BRITISH PRODUCTION OF RAYON during October amounted to 6,320,000 lb., compared with 5,700,000 lb. in September, 4,620,000 lb. in August and 5,260,000 lb. in October last year. In the first ten months of this year the total output was 60,400,000 lb., against 42,240,000 lb. in the corresponding period of 1931 and 41,250,000 lb. in that of 1930. Reports on the state of trade in rayon yarns and fabrics are by no means uniformly satisfactory, and it seems possible that yarn producers in the absence of any tendency toward higher prices, are looking to the economies arising out of working to full capacity to make the present prices profitable.

Mineral Oil

AN AGREEMENT FOR THE SUPPLY of oil products to Canada has been signed by the oil exporting trust of the U.S.S.R. This year 55,000 tons of oil products, valued at over $500,000, were exported to Canada, this being the first time that Soviet conference will discuss the disposal of electrolytic stocks and for 1933 provides for the supply of 120,000 tons of oil valued at $1,500,000.

THE PERSIAN GOVERNMENT has officially notified the Anglo-Persian Oil Co. of the annulment of the D'Arcy concession. The Government is willing, however, to consider fresh terms. The concession covers an area of 500,000 square miles of territory.

Chemical Matters in Parliament

Sulphate of Ammonia

IN the House of Commons on November 28, Mr. Lambert (Devon, South Molton), asked the Minister of Agriculture whether, having regard to the announced intention by Imperial Chemical Industries that British sellers would increase the price of sulphate of ammonia forthwith, he would take steps to secure the repeal of the present import duty on that product so as to enable land cultivators to secure fertilisers at the world price?

Major Elliot, in reply, said that the question of recommending additions to the items included in Schedule I to the Import Duties Act (the "Free List") was one for the Import Duties Advisory Committee, and it was for the interests concerned in any particular commodities to make representations direct to the committee.

Salerni Coal-Refining Process

Contract Placed for First Large Retort

AN order for the first large retort for the commercial exploitation in this country of the Salerni coal-refining process has been placed by Sir Eric Hambro, with Hadfields, Ltd. This is a development of considerable importance, having regard to experiments which have been proceeding at special plant laid down in Sheffield. The plant has been working for some months under very careful supervision with the object of further testing the commercial possibilities of this process. The results attained account for the placing of the order, through which the process will emerge on a commercial basis at a site still under consideration. Sheffield is one of a number of places from which choice will be made. The contract referred to will afford several months work, and will absorb a great amount of high-class steel of proved heat-resistance and durability. Mr. F. Lloyd, who was prominently identified with negotiations between Commendatore Salerni and representatives of local University, industrial and municipal interests with the object of attracting a new industry to Sheffield, states that the placing of the order with Hadfields demonstrated the abvisability of testing possibilities of industrial development.

Inventions in the Chemical Industry

Specifications Accepted and Applications for Patents

THE following information is prepared from the Official Patents Journal. Printed copies of Specifications Accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

Improved Emulsifying Power for Lecithin

THE emulsifying capacity of vegetable lecithin is increased by treatment with benzoyl peroxide, with or without other peroxides such as hydrogen peroxide, sodium peroxide, or barium peroxide, or for salts such as sodium percarbonate or sodium perborate. The treatment may be carried out by intimately mixing the lacithin with 0.4 per cent. of benzoyl peroxide while warming. When mixing lecithin with fat and oil and the resulting fine colloidal dispersion with water, improved results are obtained using lecithin thus treated. (See Specification No. 372,232 of Hanseatische Muehlenwerke.)

Extraction of Phenols

PHENOLS are removed from phenol-containing liquors or effluents such as gas liquors and condensates from coal distillation or cooling waters for generator gas prepared by gasifying anthracite or lignite by treatment with a water-immiscible solvent for phenols such as benzene, commercial benzole or tar oil so as to extract a large part of the phenols followed by a treatment with an adsorbent charcoal such as active carbon or bone black to extract the remainder of the phenol. In a preferred manner of carrying out the process tar oil is sprayed into the liquors and the separated liquor filtered through active carbon. The active carbon may be revivified. (See Specification No. 372,399 of W. C. Holmes and Co., Ltd.)

Applications for Patents

FIXATION OF NITROGEN. E. Briner and C. H. Wakker. Nov. 21. (Switzerland, Nov. 21, '31.) 32808.

CHEMICAL APPARATUS. British Celanese, Ltd. Nov. 23. 33108.

MIXED ESTERS. Carbide and Carbon Chemicals Corporation. Nov. 23. (United States, Dec. 10, '31.) 33136.

MANUFACTURE OF POLY-AZO DYESTUFFS. A. Carpmael (*I. G. Farbenindustrie*). Nov. 23. 33172.

PRODUCTION OF WHITE CEMENT. J. S. Dunn. Nov. 23. 33131.

PRODUCING FROM CYMOL, ETC., A HYDROCARBON WITH A LARGER MOLECULE, ETC. E. Erhnrooth and Rivanen. Nov. 21. (Germany Nov. 20, '31.) 32900.

PREPARATION OF BASIC ORGANIC NITROGEN COMPOUNDS. Girdler Corporation. Nov. 23. (United States, Nov. 23, '31.) 33127.

REMOVING AND RECOVERING ACID GASES FROM GAS MIXTURES. Girdler Corporation. Nov. 23. (United States, Nov. 23, '31.) 33128.

HYDROGENATION OF PRIMARY AROMATIC AMINES. Goodyear Tire and Rubber Co. Nov. 23. (United States, June 27.) 33181.

METHOD OF PREPARING CONTACT CATALYSTS. Goodyear Tire and Rubber Co. Nov. 23. (United States, June 8.) 33092.

MANUFACTURE OF ASPHALT DISPERSIONS. W. W. Groves (*I. G. Farbenindustrie*). Nov. 23. 33123.

MANUFACTURE OF SULPHURIC ACID DERIVATIVES OF ORGANIC COMPOUNDS. Henkel et Cie Ges. Nov. 21. (Germany, Dec. 5, '31.)

MANUFACTURE OF ESTERS SUBSTITUTED IN THE ACID RESIDUE. Henkel et Cie Ges. Nov. 25. (Germany, Dec. 5, '31.) 33409.

MANUFACTURE OF HIGH MOLECULAR SULPHUR COMPOUNDS. Henkel et Cie Ges. Nov. 25. (Germany, Dec. 15, '31.) 33410.

MANUFACTURE OF HIGH MOLECULAR SULPHUR COMPOUNDS. Henkel et Cie Ges. Nov. 25. (Germany, Jan. 25). 33411. (Cognate with 33410.)

MANUFACTURE OF TAR EMULSIONS. J. Y. Johnson (*I. G. Farbenindustrie*). Nov. 21. 32862.

MANUFACTURE OF PURE LECITHIN. J. Y. Johnson (*I. G. Farbenindustrie*). Nov. 21. 32863.

MANUFACTURE OF RESINOUS CONDENSATION PRODUCTS FROM LIGNIN. J. Y. Johnson (*I. G. Farbenindustrie*). Nov. 21. 32864.

PURIFICATION OF SULPHUR. J. Y. Johnson (*I. G. Farbenindustrie*). Nov. 21. 32865.

MANUFACTURE OF HYPOSULPHATES. J. Y. Johnson (*I. G. Farbenindustrie*). Nov. 21. 32866.

MANUFACTURE OF ASPHALT DISPERSIONS. J. Y. Johnson (*I. G. Farbenindustrie*). Nov. 23. 33123.

MANUFACTURE OF WASHING AGENTS. J. Y. Johnson (*I. G. Farbenindustrie*). Nov. 26. 33535.

MANUFACTURE OF AZO DYESTUFFS. I. G. Farbenindustrie. Nov. 22. (Germany, Feb. 15.) 32992.

MANUFACTURE OF α-CHLORETHYL-BENZENE ETC. I. G. Farbenindustrie. Nov. 24. (Germany, Nov. 24, '31.) 33272.

MANUFACTURE OF AZO DYESTUFFS. I. G. Farbenindustrie. Nov. 24. (Germany, Nov. 24, '31.) 33273.

MANUFACTURE OF ORTHO-AMINOARYL-ALKYL-SULPHONES, ORTHO-AMINOARYL-ARALKYL-SULPHONES, AND AZO DYESTUFFS THEREFROM. I. G. Farbenindustrie. Nov. 24. (Germany, Nov. 24, '31.) 33278.

MANUFACTURE OF ORTHO-AMINOARYL-ALKYL-SULPHONES, ORTHO-AMINOARYL-ARALKYL-SULPHONES, AND AZO DYESTUFFS THEREFROM. I. G. Farbenindustrie. Nov. 24. (Germany, Aug. 24.) 33279. (Cognate with 33278.)

PRODUCTION OF POTASSIUM SULPHATE. Imperial Chemical Industries. Nov. 25. 33437.

FUELS FOR INTERNAL COMBUSTION ENGINES. Imperial Chemical Industries. Nov. 25. 33438.

Specifications Accepted with Dates of Application

FERTILISERS. Ruhrchemie A.-G. April 12, 1930. 383,628.

PRODUCTION OF DYESTUFFS OF THE ANTHRAQUINONE SERIES. Imperial Chemical Industries Ltd. C. Shaw and R. F. Thomson. April 16, 1931. 383,624.

PRODUCTION OF DYEINGS. A. Carpmael (*I. G. Farbenindustrie*). May 4, 1931. 383,634.

1, 2- AND 2, 3-DIAMINO ANTHRAQUINONE SULPHATES, AND A METHOD OF ISOLATING THE SAME. I. Gubelmann and J. M. Tinker. May 6, 1931. 383,625.

STABILISATION OF BLASTING EXPLOSIVES. V. H. Williams and Imperial Chemical Industries, Ltd. May 13, 1931. 383,630.

FIBROUS COMPOSITIONS CONTAINING RESINOUS SUBSTANCES, AND PROCESSES FOR MANUFACTURING THEM. Richardson Co. July 16, 1930. 383,636.

PROCESS AND APPARATUS FOR THE MANUFACTURE OF METALLIC LEAD. P. Gamichon. June 17, 1930. 383 648.

MANUFACTURE OF INDIGOID VAT DYESTUFFS. I. G. Farbenindustrie. Aug. 1, 1930. 383,662.

PROCESS FOR PREPARING MIXED MANURES CONTAINING AMMONIUM NITRATE. Lonza Elektrizitätswerke und Chemische Fabriken A.-G. Aug. 10, 1930. 383,663.

TREATMENT OF RUBBER. Naugatuck Chemical Co. Sept. 11, 1930. 383,679.

MANUFACTURE AND PRODUCTION OF MAGNETIC MATERIALS. J. Y. Johnson (*I. G. Farbenindustrie*). Sept. 23, 1931. 383,691.

PROCESS FOR REFINING LIQUID HYDROCARBONS BY MEANS OF LIQUID SULPHUR DIOXIDE. W. W. Triggs (*Edeleanu Ges.*) Oct. 21, 1931. 383,723.

MANUFACTURE AND PRODUCTION OF ACETIC ANHYDRIDE. Courtaulds, Ltd., and J. Brown. Oct. 24, 1931. 383,727.

MANUFACTURE OF SULPHONATED NITROGENOUS DERIVATIVES OF HIGHER PARAFFIN HYDROCARBONS. A. Carpmael (*I. G. Farbinindustrie*). Nov. 3, 1931. 383 736.

MANUFACTURE AND PRODUCTION OF ANTHRAQUINONE DERIVATIVES. J. Y. Johnson (*I. G. Farbenindustrie*). Nov. 6, 1931. 383,737.

MANUFACTURE OF A SULPHURIC ACID ESTER SUITABLE FOR USE IN DYEING AND PRINTING TEXTILE FIBRES. Durand and Huguenin A.-G. Nov. 14, 1930. 383,741.

PROCESS OF PRODUCING ANTISCORBUTIC PREPARATIONS. H. D. Elkington (*Nyegaard and Co. Aktieselskab*). Nov. 17, 1931. 383,746.

MANUFACTURE OF CONDENSATION PRODUCTS. I. G. Farbenindustrie. Dec. 27, 1930. 383,764.

METHOD OF MANUFACTURING MODIFIED STARCHES, DEXTRINES, AND BRITISH GUMS. National Adhesives Corporation. Jan. 5, 1931. 383,778.

METHOD OF MAKING FLUORINE COMPOUNDS OF ALUMINIUM. Aluminium, Ltd. Jan. 29, 1931. 383,780.

PRODUCTION OF STARCHES SWELLING IN COLD WATER. A. L. Mond (*Metallges Akt.-Ges.*). Jan. 8 1932. 383,786.

PROCESSES OF REFINING MINERAL OILS. Atlantic Refining Co. Jan. 23, 1931. 383,801.

PROCESS OF MAKING DISPERSIONS OF RUBBER IN WATER. H. D. Elkington and Flintkote Corporation. March 2, 1932. 383,832.

ELECTRICALLY DEPOSITING METALS. B. J. R. Evans and Imperial Chemical Industries, Ltd. March 12, 1932. 383,842.

MANUFACTURE OF ACID DYESTUFFS OF THE ANTHRAQUINONE SERIES. I. G. Farbenindustrie. April 16, 1931. 383,871.

PROCESS FOR RENDERING AMMONIUM NITRATE NON-HYGROSCOPIC AND NON-DELIQUESCENT. L. E. D'A. Callery. April 20, 1932. 383,873.

MANUFACTURE OF ARTIFICIAL MASSES. I. G. Farbenindustrie. June 3, 1931. 383,904

PRODUCTION OF 8-OXY DERIVATIVES OF QUINOLINE. H. E. G. Rowley. (*J. D. Reidel-E de Haën Akt.-Ges.*) July 6, 1932. 383,920.

Weekly Prices of British Chemical Products

Review of Current Market Conditions

CHEMICAL markets on the whole continue extremely firm, and in some cases advances in prices are reported. The demand has been somewhat brisker than for some time. There are no price changes to report in the markets for rubber chemicals, wood distillation products, perfumery chemicals, essential oils and intermediates. The general demand for chemical products on the Manchester market during the past week has been on a modrate scale only, with transactions for the most part confined to near delivery dates. The sharp decline in sterling has had a stiffening effect on prices of imported materials, without, so far, actually affecting values. Apart from isolated instances where the basis has been shaded a little, quotations on this centre have been well held. There has been a steady demand for heavy chemicals during the week in the Scottish market, prices on the whole remaining steady. Prices remain as last week except in the following cases :—

General Chemicals

ACID CITRIC.—LONDON : 10½d. less 5%. MANCHESTER : 10¼d.

ACID, OXALIC.—LONDON : £50 per ton in casks, 53s. 6d. to 57s. 6d. per cwt. in kegs. SCOTLAND : 98/100%, £49 to £52 ex store. MANCHESTER : £50, ex store.

ACID, TARTARIC.—10¼d. per lb. SCOTLAND : B.P. crystals, 10½d. carriage paid. MANCHESTER : 10½d.

ARSENIC.—LONDON : £22 10s. c.i.f. main U.K. ports for imported material ; Cornish, nominal, £23 f.o.r. mines. SCOTLAND : White powdered £27 ex wharf ; spot, £27 10s. ex store. MANCHESTER : White powdered Cornish, £44 10s. at mines.

LEAD, ACETATE.—LONDON : White, £34 per ton. Brown, £1 per ton less. SCOTLAND : White Crystals, £34 to £36 c.i.f. U.K. ports. Brown, £1 per ton less. MANCHESTER : White, £32 ; Brown, £30.

NICKEL AMMONIUM SULPHATE.—£55 per ton d/d.

NICKEL SULPHATE.—£55 per ton d/d.

PHENOL.—6½d. to 7d. nominal. For small quantities higher figures will be asked.

POTASSIUM CARBONATE.—SCOTLAND : 96/98% spot, £28 per ton ex store. LONDON : £31 10s. to £42. MANCHESTER : £32.

POTASSIUM PRUSSATE.—LONDON : 8½d. to 9d. per lb. SCOTLAND : Yellow spot material, 8½d. ex store. MANCHESTER : Yellow, 8¼d.

SULPHATE OF COPPER.—MANCHESTER : £16 10s. to £17 per ton f.o.b.

Pharmaceutical and Fine Chemicals

ACID, SALICYLIC, B.P.—1s. 7d. to 1s. 10d. per lb.

IODINE RESUB., B.P.—15s. 7d. to 19s. 8d. per lb.

IODOFORM, B.P., CRYST., PRECIP., OR POWDER.—17s. 9d. to 22s. 9d. per lb.

POTASS. IODIDE, B.P.—13s. 10d. to 16s. 4d. per lb.

SODIUM IODIDE, B.P.—14s. 10d. to 17s. 11d. per lb.

SODIUM SALICYLATE.—Powder, 2s. to 2s. 4d. per lb. ; crystal, 2s. 1d. to 2s. 5d. LONDON* : Powder, 1s. 10d. to 2s. 5d., including packing and delivery ; crystals, 1s. 11d. to 2s. 6d.

Coal Tar Products

ACID, CARBOLIC (CRYSTALS).—6½d. per lb. Crude, 60's, 2s. to 2s. 1d. per gal. ; 2% water, 2s. MANCHESTER : Crpstals, 7¾d. ; crude, 2s. SCOTLAND : Sixties, 1s. 7d. to 1s. 8d.

NAPHTHA.—Solvent, 90/160, 1s. 5d. to 1s. 6d. per gal. ; 95/160, 1s. 8d. ; 90/190, 1s. 1d. to 1s. 2d. LONDON : Solvent, 1s. 3½d. to 1s. 4d. ; heavy, 11d. to 1s. 0½d. f.o.r. SCOTLAND : 90/160, 1s. 3d. to 1s. 3½d. ; 90/190, 11d. to 1s. 2d.

PITCH.—Medium soft, ¼4 7s. 6d. to £5 per ton. MANCHESTER : £4 15s. to £5 f.o.b. LONDON : £4 14s. to £4 16s. 6d. f.o.b. East Coast port. SCOTLAND : £5.

Nitrogen Fertilisers

SULPHATE OF AMMONIA.—The export market remains firm and the price for neutral quality, basis 20.6% nitrogen is £5 7s. 6d. per ton f.o.b. U.K. port in single bags for December shipment. For January shipment the price is £5 10s. per ton.

NITRATE OF SODA.—£8 12s. for December and £8 14s. for January delivered to farmers' nearest station in 6-ton lots.

* Prices quoted by other manufacturers.

From Week to Week

A GOLD NUGGET weighing 52 oz. 12 dwt. was discovered at Waanyarra, Victoria, on September 17 at a depth of 14 ft.

MR. W. H. WHITEWAY-WILKINSON, of Whiteway and Co., Ltd., clay merchants, Kingsteignton, was elected chairman of the Newton Abbot Guardians Committee on November 23.

THE RAMSAY CHEMICAL DINNER of the Glasgow section of the Society of Chemical Industry will be held at Central Station Hotel on December 9 at 6 p.m. The principal speaker will be Sir Harry McGowan.

AT THE INAUGURAL MEETING of the Manchester section of the Institute of Physics was held at Manchester on November 18. Professor W. L. Bragg was elected chairman, and Dr. H. Lowery, local hon. secretary.

A PAPER CONCERNING paper making and printing was given by Mr. T. S. Foweraker, of E. S. and A. Robinson, at a meeting at the County Hotel, Taunton, on November 25, of the West of England Division of the technical section of the Paper Makers' Association.

TWO LECTURES on "An Outline of an Electrochmical (Electronic) Theory of the Course of Organic Reactions" by Dr. Robert Robinson, Waynflete Professor of Chemistry in the University of Oxford, have been published in booklet form by the Institute of Chemistry.

W. P. HARTLEY (LONDON AND AINTREE), LTD., is to erect a vegetable canning factory at Aintree, Liverpool, affording direct employment to 100 people and 400 others at farms in the district. The building and plant will cost about £15,000. The plant will be made in Lancashire and the cans in Worcestershire. It is expected that 250 acres will be given over to pea cultivation, while other vegetables will later be grown.

ACCOMPANYING THE NOTICES which have been sent out in respect of the general meeting of the Lautaro Nitrate Co., Ltd., to be held at Valparaiso, Chile, on December 30, are proxy forms in favour of two members of the board in Chile. It is understood that proxies are being sought for Mr. G. A. Whelpley, who is chairman of the company and also chairman of Cosach, and on the board of which he represents the Guggenheim interests. It is understood that Mr. H. J. Garthwaite, of 106 Fenchurch Street, E.C.—who has taken the chair at several meetings of Lautaro preferred shareholders when protests were made in connection with Cosach—is sending out circulars asking preferred shareholders for proxies in his favour, so that they may be adequately represented at the Lautaro meeting.

SIR WILLIAM JARRATT, the Comptroller-General of Patents, Designs and Trade Marks, is retiring from the Patent Office after thirty-eight years' service and six years of the comptrollership.

THE ANILIN CHEMICAL CO. of Vienna, in which the German Dye Trust is interested, has acquired the majority of the Chemosan Union and Fritz Petzoldt Co. shares.

THE ILLUSTRATION of the Vitreosil absorption vessel in the article on "Vitreosil in the Chemical Industry," which appeared in THE CHEMICAL AGE of November 19 (page 486) was inadvertently inserted upside down.

MR. T. FRANKLIN SIBLY, vice-chancellor of the University of Reading, has been appointed a member of the Advisory Council to the Committee of the Privy Council for Scientific and Industrial Research.

THE MEMBERS OF BOARDS OF FACULTIES of the University of Manchester have appointed Professor L. J. Mordell as Dean of the Faculty of Science for the year 1933. Mr. Frank Morton and Mr. F. S. Statham have been appointed as demonstrators in the Faculty of Chemical Technology.

THE RUSSIAN OIL PRODUCTS CO. has leased at Ely Harbour, Cardiff, from the Great Western Railway Co., a site for a new oil depot. Vessels will discharge at a wharf in the Ely River. This will be the centre for the distribution of Russian oil products for South Wales.

ENCOURAGING OBSERVATIONS were address to the coalowners of South Wales last week by Colonel R. T. G. Tangye, the head of the engineering firm of Tangye, at the exhibition in Cardiff promoted by the South Wales Institute of Engineers. He said that scientists and engineers were preparing the way for the production of oil from coal. It was certain that before many years were passed coal from South Wales would produce oil which engineers both on land and on sea can depend upon.

THE IMPORT DUTIES ADVISORY COMMITTEE has under consideration applications for increased import duties on linseed oil, peat products and other goods. Any representations in regard to these applications should be addressed in writing to the secretary, Import Duties Advisory Committee, Caxton House (West Block), Tothill Street, London, S.W.1, not later than December 19. The comm has decided not to make any recommendation in respect o application for the imposition of increased duties on common

NEW SCIENTIFIC INSTITUTIONS in the Soviet Union are being opened, new schools founded, and more and more sums expended for scientific research. The scientific engineer, Tatarinov, has perfected a simple method of securing primary hydrocarbons by synthetic means. Tatarinov has worked on this process for eighteen years. His discovery permits the synthetic production of acetylene, rubber and ethyl spirits.

THE PROGRAMME of the Coal Utilisation Council was outlined by Mr. W. R. Gordon, director of the Council, at a luncheon of the Coal Industries Society on November 25. The council's work, he said, divided itself naturally into two periods—that of research and that of propaganda. Research could be sub-divided into three sections. The first consisted of market investigation; the second, technical research; and the third, commercial intelligence. The last of these implied the collation of information regarding possible orders for coal appliances and fuel.

IN THE NOVEMBER issue of the "Journal of Scientific Instruments" Dr. Julius Grant writes on a device whereby ultra-violet light is used in titrations employing fluorescent substances as indicators. Formerly, it was necessary to switch the light on and off with a resulting loss of time due to optical acclimatisation and interference with the sequence of a titration. The difficulty was finally overcome by sealing two lead shots and about 3 c.c. of a solution containing about 50 mg. of quinine in 10 per cent. sulphuric acid into a glass tube. The faintest ray of ultra-violet light, although itself quite invisible to the naked eye, suffices to cause the whole of the float to glow with a brilliant blue fluorescence and to illuminate the meniscus and the graduations in its immediate neighbourhood. In this way titrations may be carried out in the dark with an accuracy of one drop.

A CONFERENCE IS BEING CALLED by the Building Research Station of the Department of Scientific and Industrial Research to consider proposals for the establishment of a fire testing station for the building industry. The conference will be held at the Institution of Civil Engineers on December 7, at 11 a.m., under the chairmanship of Sir Clement Hindley. Requests have been received in recent years by the Building Research Station for fire tests on building materials and structures, but it has not been possible to meet them until now chiefly because a sound basis for fire-testing had not been enunciated. The position has been clarified by the recent issue by the British Standards Institution of "British Standard Definitions and Methods of Tests for Fire Resistance, Incombustibility and Non-Inflammability of Building Materials and Structures." In these circumstances, it is hoped that the conference will enable steps to be taken to provide adequate fire testing facilities. Firms and bodies who have not received invitations to the conference direct, but who would wish to send representatives, should communicate with the Director, Building Research Station, Garston, Watford, Herts.

ON THE RECOMMENDATION of the Import Duties Advisory Committee, pumping machinery and dredgers have been exempted from the whole or part of the duties chargeable under the Import Duties Act, 1932. Application may be made by, or on behalf of, a firm purchasing machinery for their own use, or by an importer having the sole agency for the sale of a particular machine in this country. Application forms may be obtained from the secretary, Import Duties Advisory Committee, Caxton House (West Block), Tothill Street, Westminster, London, S.W.1.

AN IMPORTANT DISCOVERY has been made by chemists of the North British Chemical Co., Ltd., of Droylsden (Manchester). After prolonged research they had produced a new synthetic paint which has been successfully tested in different parts of the country, and will resist gases, salt air, and can withstand twisting and bending. It can be applied to plaster, wood, or metal, and, it is claimed, that its glossiness and final hardness of surface more nearly approaches that of glass than that obtained by any other air-drying paint. It is also claimed that in use it costs less than ordinary paints, enamels and varnishes.

MEMBERS OF THE POYNTING PHYSICAL SOCIETY of Birmingham University were addressed by Professor W. L. Bragg recently on "Applications of X-Ray Analysis in Pure and Applied Science." Professor Bragg said X-ray analysis enabled them to find out how atoms were arranged in solid bodies. Such an analysis had become something that was comparable to chemical analysis. The lecturer demonstrated to what uses X-ray could be put as an auxiliary method by chemists and metallurgists in finding the nature of materials they were investigating. By such analysis the investigator was enabled to see the crystals and their phases; in other words, how the structure was built up. X-ray analysis also enabled them definitely to identify materials.

IMPORTANT INDUSTRIAL RESEARCH work at Sheffield University is attracting theoretical and practical attention in many other parts of the world. The 27th annual report of the senate of that institution states there has been during the session a continuance of research work, of the highest importance. In the Department of Mechanical Engineering this work has been concerned in part, with the effect of repeated stresses on different metals under varying conditions. The subjects of research in the Department of Metallurgy included the crystalline structure of ingots; the properties of metals and alloys, examined by X-ray methods; the oxygen-content of steel; the potential energy of cold-worked material, and a number of problems connected with the cold-working of steel. The Department of Glass Technology has been actively engaged with the manufacturers of glass and refractories in fixing standards for glass melting pots, and with workers in German laboratories in formulating international glass standards.

Forthcoming Events

Dec. 5.—Society of Chemical Industry (London Section). "Insect Pests Affecting Stored Products." Professor J. W. Munro. 8 p.m. Burlington House, Piccadilly, London.

Dec. 6.—British Wood Preserving Association. "Timber Preservation from the Estate Agent's Point of View." S. A. Kelly. 6 p.m. Auctioneers' and Estate Agents' Institute, 29 Lincoln's Inn Fields, London.

Dec. 6.—Students' Chemical Society of the Manchester College of Technology. "The Manufacture of Beet Sugar." Dr. S. H. Jenkins. 5 p.m. Manchester.

Dec. 6.—Institute of Metals (Swansea Section). "Some Industrial Pyrometry Problems." Ezer Griffiths. 6.15 p.m. Y.M.C.A. Swansea.

Dec. 7.—Society of Dyers and Colourists (Midlands Section). "Residual Alkali and Sulphite Faults in Hosiery Materials." F. L. Goodall. Leicester.

Dec. 7.—British Association of Chemists (Scottish Section). "The Fluid Film and its Technical Significance." Dr. D. Bain. 7.30 p.m. 39 Elmbank Crescent, Glasgow.

Dec. 7.—British Association of Chemists (Notts and Derby Section). Whist Drive and Dance. 7.30 p.m. King's Cafe, Derby.

Dec. 7.—Institution of the Rubber Industry (West of England Section). "Road and Rail—The Rubber Industry's Contribution." G. B. Williamson. Town Hall, Trowbridge.

Dec. 7.—Business Research and Management Association of Great Britain. "Profitable Trade Association Service to Industry." J. B. Graham. 6.45 p.m. Anderton's Hotel, Fleet Street, London.

Dec. 7.—Society of Public Analysts. 8 p.m. Burlington House, Piccadilly, London.

Dec. 8.—Society of Chemical Industry (Nottingham Section). "The Production of the Unshrinkable Finish on Knitted Woollen Goods by means of Aqueous Solutions of Chlorine and Bromine." S. R. Trotman. 7.30 p.m. University College, Nottingham.

Dec. 8.—Society of Chemical Industry (Yorkshire Section) and Institute of Chemistry (Leeds Area Section). "Alcohol through the Ages." Dr. E. F. Armstrong.

Dec. 8.—Oil and Colour Chemists' Association. "Some Paint Problems of Building Research." H. M. Llewellyn. 7.30 p.m. 30 Russell Square, London.

Dec. 8.—Institute of Chemistry (Manchester Section). Chairman's Address. Annual Dinner and Dance. "The Manchester," Ltd., Manchester.

Dec. 8.—Insitute of Metals (London Section). "Some Aspects of the Selection of Engineering Material." L. B. Hunt. 7.30 p.m. 83 Pall Mall, London.

Dec. 8.—Annual Chemical Dinner. Connaught Rooms, Great Queen Street, London, 7.30 p.m.

Dec. 9.—Society of Chemical Industry (South Wales Section). "The Early History of the Rubber Industry." B. D. Porritt. 7 p.m. Thomas' Café, High Street, Swansea.

Dec. 9.—Leicester Literary and Philosophical Society (Chemistry Section). "Bakelite Materials." By a Member of the Technical Staff of Bakelite, Ltd. 7.30 p.m. College of Technology, Leicester.

Dec. 9.—Oil and Colour Chemists' Association (Manchester Section). "Printing Ink Manufacture." G. F. Jones. College of Technology, Manchester.

Dec. 9.—West Cumberland Society of Chemists and Engineers. "Oil from Coal." K. Gordon. 7 p.m. Workington.

Dec. 9.—Institute of Metals (Sheffield Section). "Degreasing and Cleaning." W. F. Jesson. 7.30 p.m. University, Sheffield.

Dec. 9.—Ramsay Chemical Dinner. Central Station Hotel, Glasgow. 6 p.m.

Dec. 9.—Society of Dyers and Colourists (London Section). "The Spicer-Dufay System of Colour Photography and Colour Printing." C. Bonamico and T. Thorne Baker.

Dec. 9 and **10.**—Borough Polytechnic. Exhibition of Students' Work. Friday 6 to 9 p.m. Saturday 2.30 to 9.30 p.m. Borough Road, London.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

Mortgages and Charges

[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]

BRITTOL SYNDICATE, LTD., London, S.W., producers of liquid fuel, etc. (M., 3/12/32.) Registered November 21, £1,000 debentures, part of £20,000 (not ex.); general charge. *£8,000. April 29, 1932.

Satisfaction

OXLEY'S (J. C.) DYES & CHEMICALS, LTD., Dewsbury. (M.S., 3/12/32.) Satisfaction registered November 22, of mort. registered August 4, 1920.

London Gazette, &c.

Company Winding Up

THE CHEMICAL NEWS, LTD. (C.W.U. 3/12/32.) Statutory meetings at 33 Carey Street, Lincoln's Inn, London, December 8; creditors at 2.30 p.m.; contributories at 3 p.m.

Company Winding Up Voluntarily

METAL SAFETY GLASS, LTD. (C.W.U.V. 3/12/32.) By special resolution, November 23.

Company News

Scottish Agricultural Industries, Ltd.—The total revenue for the year to June 30 was £35,966, against £35,924 in the previous year. The preference dividend absorbs £34,634 and £4,514 is carried forward, against £3,182 brought in.

British Tar Products.—The net profits for the year to September 30 last amount to £49,150. After payment of a dividend of 10 per cent. and a bonus of 5 per cent., on both preferred ordinary and ordinary shares, there remains £3,217 to be carried forward.

British Goodrich Rubber Co., Ltd.—The directors announce a net trading profit in respect of the year ended September 30 last, after payment of debenture interest and subject only to income tax, of approximately £87,500, compared with £73,332 in the previous twelve months.

Tate & Lyle, Ltd.—A preliminary statement for the past year shows a gross profit of £1,075,030, against £992,732 last year. The dividend on the ordinary shares is to be brought up to 16 per cent., an increase of 2½ per cent., and £360,000 is allocated to reserves, leaving to be carried forward £65,112.

New Chemical Trade Marks

Compiled from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52 Chancery Lane, London, W.C.2.

Opposition to the Registration of the following trade marks can be lodged up to December 16, 1932.

Lorikal. 535,535. Class 4. Oils and fats for use in manufactures. H. Th. Bohme. A. G., 29 Moritzstrasse, Chemnitz, Saxony, Germany; manufacturers and merchants. October 7, 1932.

Necolastic. 534,690. Class 4. Raw, or partly prepared, vegetable, animal and mineral substances used in manufactures, not included in other classes. Nobel Chemical Finishes, Ltd., Imperial Chemical House, Millbank, London, S.W.1. September 2, 1932.

Opposition to the registration of the following trade marks can be lodged up to December 23, 1932.

Crexol. 533,990. Class 1. Solvents for use in paints, varnishes, lacquers and nitro-cellulose solutions, being chemical substances for use in manufactures. Rex Campbell & Co., Ltd., 7 Idol Lane, Eastcheap, London, E.C.3. August 4, 1932. (By consent.)

Hucol. 534,469. Class 1. Cellulose lacquers, cellulose bronze paints, cellulose enamels and cellulose wood finishers. Hucol, Ltd., Metana House, Hind Court, Fleet Street, London, E.C.4. August 25, 1932.

Thipyron. 534,573. Class 1. Chemical substances used in the manufacture of india-rubber and for the vulcanisation of india-rubber. Schering-Kahlbaum A.G., Mullerstrasse 170-171 Berlin, N.39, Germany; August 29, 1932.

Taekal. 534,123. Class 2. Chemical substances used for agricultural, horticultural, veterinary, and sanitary purposes. Crown Chemical Co., Ltd., 120 and 122 Victoria Street, London, S.W.1; August 10, 1932.

Tariff Changes

Canada.—By an Order in Council dated October 28, 1932, mixtures of methyl alcohol and acetone containing not more than 15 per cent. by weight of acetone, when imported by tanners for use exclusively as a solvent for dyes for the dyeing of leather in their own factories, to be used as materials in Canadian manufactures, are subject to reduced rates of duties of Customs, until otherwise established, viz., British Preferential Tariff, 20 cents per proof gallon; Intermediate Tariff, 20 cents per proof gallon; General Tariff, 20 cents per proof gallon.

Chemical Trade Inquiries

The following trade inquiries are abstracted from the "Board of Trade Journal." Names and addresses may be obtained from the Department of Overseas Trade (Development and Intelligence), 35 Old Queen Street, London, S.W.1 (quote reference number).

Trinidad.—A firm of agents in Trinidad wishes to obtain the representation, on a commission basis, of United Kingdom manufacturers, of paints, tar and oakum, turpentine and linseed oil. (Ref. No. 752.)

Latvia.—The British Consul at Riga reports that the Latvian Ministry of Finance is calling for tenders, to be presented in Riga by December 16, for the erection of a beet sugar factory with a working capacity of 800 metric tons of beetroot per 24 hours. (Ref. A.X. 11612.)

New Companies Registered

Metro Cellulose and Cement Spraying Co., Ltd., 8 Serjeants Inn, Temple, London, E.C.4. Registered as a "private" company, on November 8. Nominal capital £2,000 in £1 shares. Spraying contractors, builders and contractors, chemists, druggists, drysalters, oil and colourmen, etc. Directors: G. P. Harben, F. A. Simpson, D. W. Rait-Smith.

Milton and Milton, Ltd. Registered as a "private" company on November 5. Nominal capital £3,000 in £1 shares. Wholesale and retail chemists (both pharmaceutical and otherwise), druggists, manufacturers of and dealers in all kinds of medicinal preparations, chemicals, perfumery, and toilet and domestic preparations, etc. Directors: G. H. Milton, Wymbourne Gate, Whitmore Road, Newcastle, Staffs; and J. H. Milton.

Nonsil, Ltd. Registered as a "private" company on November 5. Nominal capital £600. Chemical engineers, manufacturers and merchants, contractors, distillers, dyers, manufacturers of and dealers in cellulose, acetate, bakelite, synthetic resins formaldehyde compounds, thermo powders, acids, etc. Directors: J. Thame, 60 Queen Victoria Street, London, E.C., and E. A. S. Martin.

Robert Heyes, Ltd., 42 Henry Street, Blackpool. Registered as a "private" company on November 21. Nominal capital, £1,000 in £1 shares. Manufacturers of and dealers in varnish, enamel, polish, lacquers, shellac, gums, glues, sandpaper, cellulose, size, pigments, compositions, artificial manures, fertilisers, insecticides, weed killers, chemicals, etc. Directors: R. Heys, senr., R. Heys, jnr., H. Heys, Mrs. M. Heys.

Roche, Ltd. Registered in Dublin as a "private" company on November 8. Nominal capital £2,000 in £1 shares. Objects: To carry on the business of chemists, druggists, drysalters, oil and colourmen, etc. Directors: M. Roche, Vine Villa, Bishop Street, Cork, and Mrs. A. Roche.

Stevco (Birmingham), Ltd. Registered as a "private" company on November 24. Nominal capital, £100 in £1 shares. Importers, distributors, manufacturers and sellers of and dealers in oil products, including motor spirit, lubricating oils, cleaning fluids, polishes, disinfectants, chemicals and chemical preparations, etc. Directors: G. R. Stevens, 1 Davenant Road, Oxford, W. F. Stevens, N. E. D. Stevens.

The Moore Carbonizing Company, Ltd.—Registered as a "private" company on November 17. Nominal capital of £25,000 in £1 shares. Objects to acquire, work and turn into account patents relating to the distillation, reduction, transformation, calcination or extraction of vaporisable matter from coal, shale, wood, peat and other fragmentary carbonaceous material, and in particular to acquire all or any of the rights, assets and liabilities of the Low Temperature Carbonisation Syndicate. Directors: S. Moore, 37 Cable Road, Hoylake, R. O. Lloyd, and J. M. Rigby.

Vix Manufacturing Company, Ltd., 8 St. John's Street, E.C. Registered as a "private" company on November 14. Nominal capital £100 in £1 shares. Soap manufacturers, exporters and dealers, importers and exporters of and dealers in soap, matches, etc. Directors: R. C. Hull, Mrs. Alice C. Hull, P. J. Hull.

W. R. E. Woodstock, Ltd., 498 First Avenue House, High Holborn, London, W.C.1. Registered as a "private" company on November 10. Nominal capital £1,500. Merchants of and dealers in fuel oil, lubricating oil, petrol, kerosene, medical oils, coal and coal bye-products, etc. Directors: E. C. Gibbs and R. C. Bryan.

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SALES BY AUCTION

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RE ACETATE PRODUCTS CORPORATION, LTD. (in Voluntary Liquidation).—By Order of the Liquidator, Sir W. Harry Peat, K.B.E., F.C.A., of Messrs. Peat, Marwick, Mitchell and Co.—Messrs.

FULLER, HORSEY, SONS AND CASSELL

have been instructed to realise this Company's Non-Inflammable Celluloid Works at Waddon, near Croydon, and they will accordingly offer same for SALE by AUCTION, on the PREMISES, on TUESDAY, JANUARY 10th, 1933, at eleven o'clock precisely, in the following manner.

As a First Lot will be Offered the

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IMPORTANT NOTICE TO CELLULOID MANUFACTURERS.

The Factory will only be thus dealt with if not previously Sold as a whole, and, pending the Auction the Liquidator would be willing to consider Any Offer for the Factory, with All or Any of the Plant and Machinery.

Particulars of the Property and Catalogues of the Machinery may be had, when ready, of Messrs. PEAT, MARWICK, MITCHELL AND CO., Chartered Accountants, 11 Iremonger Lane, E.C.2; of Messrs. CLIFFORD-TURNER, HOPTON AND LAWRENCE, Solicitors, 81 Gresham Street, E.C.2; or of Messrs. FULLER, HORSEY, SONS AND CASSELL, Factory and Machinery Auctioneers, 11 Billiter Square, Fenchurch Street, E.C.3.